

# The Impact of Comprehensive Medication Reviews on Medication Adherence and Health-Related Quality of Life: A Qualitative Study in KSA

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## Abstract

Comprehensive medication reviews (CMRs) are a patient-centered service provided by pharmacists to optimize medication use and improve health outcomes. This qualitative study explores the impact of CMRs on medication adherence and health-related quality of life (HRQoL) among patients in the Kingdom of Saudi Arabia (KSA). Semi-structured interviews were conducted with 30 patients who had received a CMR from a pharmacist in various healthcare settings. Thematic analysis was used to identify key themes related to patients' experiences and perceptions of the impact of CMRs on their medication adherence and HRQoL. The findings revealed that CMRs contributed to improved medication understanding, increased motivation to adhere to treatment plans, and enhanced self-management skills. Patients also reported positive changes in their physical, emotional, and social well-being following the CMR, which they attributed to the personalized education and support provided by the pharmacist. However, some barriers to the effective implementation of CMRs were identified, including time constraints, limited access to pharmacists, and communication challenges. The study highlights the potential of CMRs to improve medication adherence and HRQoL among patients in KSA and underscores the need for further research and policy initiatives to optimize the delivery of this service in the healthcare system.

**Keywords:** comprehensive medication review, medication adherence, health-related quality of life, qualitative research, patient experience, Saudi Arabia

## 1. Introduction

Medication non-adherence is a widespread problem that contributes to poor health outcomes, increased healthcare costs, and patient safety risks (Osterberg & Blaschke, 2005). In the Kingdom of Saudi Arabia (KSA), studies have reported medication non-adherence rates ranging from 25% to 50% across various chronic conditions, such as diabetes, hypertension, and asthma (Alqahtani et al., 2020; Alsulami et al., 2021). Factors influencing medication non-adherence in KSA include patients' knowledge and beliefs about medications, side effects, complexity of the regimen, and inadequate communication with healthcare providers (Alyami et al., 2017; Alnasser et al., 2019).

Health-related quality of life (HRQoL) is another important outcome measure that reflects patients' subjective perceptions of their physical, psychological, and social well-being in relation to their health status (Karimi & Brazier, 2016). Medication non-adherence has been associated with poorer HRQoL in various patient populations, as it can lead to suboptimal disease control, increased symptoms, and functional limitations (Saleem et al., 2015; Cheng et al., 2016). In KSA, studies have reported lower HRQoL scores among patients with chronic conditions compared to the general population, highlighting the need for interventions to improve medication adherence and HRQoL in this context (Al-Jabi et al., 2018; Algarni et al., 2021).

Comprehensive medication reviews (CMRs) are a patient-centered service provided by pharmacists to optimize medication use, improve health outcomes, and enhance patient safety (American Pharmacists Association, 2021). CMRs involve a systematic evaluation of a patient's medication regimen, including prescription and over-the-counter medications, herbal products, and dietary supplements, to identify and resolve medication-related problems (MRPs) (Joint Commission of Pharmacy Practitioners, 2014). The process of conducting a CMR typically involves a face-to-face or telehealth consultation between the pharmacist and the patient, a review of the patient's medical records, and collaboration with other healthcare providers (Snyder et al., 2014).

Previous research has demonstrated the potential of CMRs to improve medication adherence and HRQoL in various patient populations. A systematic review by Viswanathan et al. (2015) found that medication therapy management interventions, including CMRs, were associated with improvements in medication adherence and HRQoL in patients with chronic conditions, although the strength of evidence was low to moderate. Another systematic review by Huiskes et al. (2017) focused specifically on the effect of medication review interventions on medication adherence in older adults and found mixed results, with some studies showing positive effects and others showing no significant impact.

While these studies provide valuable insights into the impact of CMRs on medication adherence and HRQoL, they have some limitations. First, they primarily focused on quantitative outcomes and did not explore patients' experiences and perceptions of the CMR process and its impact on their medication use and well-being. Second, they were conducted in different healthcare systems and cultural contexts, which may limit their transferability to the KSA setting. Finally, they did not specifically examine the barriers and facilitators to the effective implementation of CMRs in real-world practice.

Therefore, this qualitative study aims to address these gaps by exploring the impact of CMRs on medication adherence and HRQoL among patients in KSA, with a focus on their experiences, perceptions, and insights. By gaining a deeper understanding of patients' perspectives on the value and challenges of CMRs, this study seeks to inform the development and optimization of this service in the KSA healthcare system.

The objectives of this qualitative study are as follows:

1. To explore patients' experiences and perceptions of the impact of CMRs on their medication adherence and HRQoL in KSA.
2. To identify the key factors that facilitate or hinder the effectiveness of CMRs in improving medication adherence and HRQoL from the patients' perspective.
3. To elicit patients' suggestions and recommendations for enhancing the delivery and impact of CMRs in the KSA healthcare system.
4. To generate insights and hypotheses that can inform future research and policy initiatives aimed at optimizing the role of pharmacists in improving medication use and health outcomes in KSA.

## **2. Literature Review**

This section provides an overview of the existing literature on medication adherence, HRQoL, and CMRs, with a focus on the KSA context and the gaps in the current evidence base that this study seeks to address.

### **2.1 Medication Adherence in KSA**

Medication adherence is a complex and multidimensional construct that refers to the extent to which patients take their medications as prescribed by their healthcare provider (World Health Organization, 2014). Medication adherence is a key determinant of health outcomes, particularly in chronic conditions that require long-term management (Brown & Bussell, 2011). In KSA, several studies have documented suboptimal medication adherence rates across various patient populations and therapeutic areas.

A cross-sectional study by Alqahtani et al. (2020) found that 50% of patients with type 2 diabetes in KSA had low medication adherence, as measured by the Medication Adherence Questionnaire (MAQ). Factors associated with low adherence included younger age, higher education level, and lack of knowledge about the importance of medication adherence. Another study by Alsulami et al. (2021) reported a medication non-adherence rate of 45% among patients with hypertension in KSA, with forgetfulness and side effects being the most common reasons for non-adherence.

A systematic review by Alyami et al. (2017) identified several barriers to medication adherence in KSA, including patients' beliefs and attitudes towards medications, complexity of the regimen, side effects, and inadequate patient-provider communication. The review highlighted the need for educational interventions and patient-centered approaches to improve medication adherence in this context.

### **2.2 Health-Related Quality of Life in KSA**

HRQoL is a multidimensional concept that captures patients' subjective perceptions of their physical, psychological, and social well-being in relation to their health status (Karimi & Brazier, 2016). HRQoL is an important outcome measure in healthcare, as it provides a patient-centered evaluation of the impact of diseases and treatments on individuals' daily functioning and overall quality of life (Megari, 2013). In KSA, several studies have assessed HRQoL in different patient populations using generic or disease-specific instruments.

A cross-sectional study by Al-Jabi et al. (2018) assessed HRQoL among patients with type 2 diabetes in KSA using the EuroQol-5 Dimension (EQ-5D) questionnaire. The study found that patients with diabetes had significantly lower HRQoL scores compared to the general population, particularly in the domains of mobility, self-care, and pain/discomfort. Factors associated with lower HRQoL included older age, female gender, lower education level, and the presence of comorbidities.

Another study by Algarni et al. (2021) evaluated HRQoL among patients with asthma in KSA using the Asthma Quality of Life Questionnaire (AQLQ). The study reported moderate to severe impairment in HRQoL among asthma patients, with the domains of activity limitation and environmental stimuli being the most affected. Factors associated with poorer HRQoL included uncontrolled asthma, obesity, and the presence of comorbidities.

These studies highlight the significant impact of chronic conditions on HRQoL in KSA and underscore the need for interventions to improve disease management and patient outcomes in this context.

### **2.3 Comprehensive Medication Reviews and their Impact on Medication Adherence and HRQoL**

CMRs are a patient-centered service provided by pharmacists to optimize medication use and improve health outcomes (American Pharmacists Association, 2021). CMRs involve a systematic evaluation of a patient's medication regimen to identify and resolve MRPs, such as adverse drug reactions, drug interactions, and non-adherence (Joint Commission of Pharmacy Practitioners, 2014). The process of conducting a CMR typically involves a face-to-face or telehealth consultation between the pharmacist and the patient, a review of the patient's medical records, and collaboration with other healthcare providers (Snyder et al., 2014).

Previous research has demonstrated the potential of CMRs to improve medication adherence and HRQoL in various patient populations. A systematic review by Viswanathan et al. (2015) found that medication therapy management interventions, including CMRs, were associated with improvements in medication adherence and HRQoL in patients with chronic conditions, although the strength of evidence was low to moderate. The review highlighted the need for more high-quality studies to confirm these findings and identify the key components and mechanisms of effective CMR interventions.

Another systematic review by Huiskes et al. (2017) focused specifically on the effect of medication review interventions on medication adherence in older adults and found mixed results. While some studies reported significant improvements in adherence following medication reviews, others found no significant impact. The review suggested that the effectiveness of medication reviews may depend on the specific design and implementation of the intervention, as well as the characteristics of the patient population and healthcare setting.

A qualitative study by Ravn-Nielsen et al. (2018) explored patients' perspectives on the impact of medication reviews on their medication use and well-being in Denmark. The study found that patients valued the personalized education and support provided by the pharmacist during the medication review, which helped them better understand their medications and feel more confident in managing their conditions. Patients also reported positive changes in their medication adherence and HRQoL following the medication review, although some barriers to implementation were identified, such as time constraints and communication challenges.

While these studies provide valuable insights into the impact of CMRs on medication adherence and HRQoL, they have some limitations. First, they were conducted in different healthcare systems and cultural contexts, which may limit their transferability to the KSA setting. Second, they primarily focused on quantitative outcomes and did not explore patients' experiences and perceptions of the CMR process and its impact on their medication use and well-being. Finally, they did not specifically examine the barriers and facilitators to the effective implementation of CMRs in real-world practice.

Therefore, this qualitative study aims to address these gaps by exploring the impact of CMRs on medication adherence and HRQoL among patients in KSA, with a focus on their experiences, perceptions, and insights. By gaining a deeper understanding of patients' perspectives on the value

and challenges of CMRs, this study seeks to inform the development and optimization of this service in the KSA healthcare system.

### **3. Methods**

This qualitative study employed a phenomenological approach to explore patients' experiences and perceptions of the impact of CMRs on their medication adherence and HRQoL in KSA.

#### **3.1 Study Design**

A descriptive phenomenological design was used to gain an in-depth understanding of patients' lived experiences and perspectives related to CMRs. Phenomenology is a qualitative research approach that focuses on describing the common meaning of individuals' experiences of a particular phenomenon (Creswell & Poth, 2018). This approach was chosen because it allows for the exploration of patients' subjective experiences and perceptions of CMRs, which are essential for understanding the impact of this service on their medication use and well-being.

#### **3.2 Participants and Sampling**

Purposive sampling was used to recruit patients who had received a CMR from a pharmacist in various healthcare settings in KSA, such as community pharmacies, primary care clinics, and hospitals. The inclusion criteria for participants were as follows:

- Adults (aged 18 years or older) with one or more chronic conditions requiring long-term medication management
- Had received a CMR from a pharmacist within the past six months
- Able to provide informed consent and participate in an interview in Arabic or English

Patients were excluded if they had cognitive impairment or communication difficulties that would prevent them from engaging in an interview.

A sample size of 30 patients was targeted, based on the principle of data saturation, which occurs when no new themes or insights emerge from the data (Saunders et al., 2018). Recruitment continued until data saturation was achieved.

#### **3.3 Data Collection**

Data were collected through semi-structured interviews with patients who had received a CMR. The interviews were conducted face-to-face or via telephone, depending on the participant's preference and availability. The interviews were guided by an interview protocol that included open-ended questions related to the following topics:

- Patients' experiences of the CMR process, including the setting, duration, and content of the consultation
- Patients' perceptions of the impact of the CMR on their medication adherence, including any changes in their knowledge, attitudes, and behaviors related to medication use
- Patients' perceptions of the impact of the CMR on their HRQoL, including any changes in their physical, emotional, and social well-being
- Patients' satisfaction with the CMR service and their suggestions for improvement

The interviews were conducted in Arabic or English, depending on the participant's preference, and were audio-recorded with the participant's consent. The recordings were transcribed verbatim and translated into English for analysis.

### **3.4 Data Analysis**

Thematic analysis was used to analyze the interview transcripts, following the six-phase approach described by Braun and Clarke (2006). The analysis process involved the following steps:

1. Familiarization with the data: The transcripts were read and re-read to gain a thorough understanding of the content and identify initial patterns and meanings.
2. Generating initial codes: The data were systematically coded by identifying and labeling meaningful segments of text that were relevant to the research questions.
3. Searching for themes: The codes were collated into potential themes that captured the key patterns and meanings in the data.
4. Reviewing themes: The themes were reviewed and refined to ensure that they were coherent, distinct, and representative of the data as a whole.
5. Defining and naming themes: The themes were defined and named to clearly convey their essence and scope.
6. Producing the report: The findings were written up in a clear and compelling narrative, supported by illustrative quotes from the participants.

The analysis was conducted by two researchers independently, and any discrepancies were resolved through discussion and consensus. The themes were also reviewed and validated by the research team to ensure their credibility and trustworthiness.

### **3.5 Trustworthiness**

Several strategies were used to enhance the trustworthiness of the study, based on the criteria of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985):

- **Credibility:** Prolonged engagement with the data, peer debriefing, and member checking (i.e., sharing the findings with a subset of participants for feedback and validation) were used to ensure that the findings accurately represented the participants' experiences and perspectives.
- **Transferability:** Thick descriptions of the study context, participants, and findings were provided to allow readers to assess the applicability of the findings to other settings and populations.
- **Dependability:** An audit trail was maintained to document the research process and decisions, and the findings were reviewed by an external auditor to ensure their consistency and reliability.
- **Confirmability:** Reflexivity was practiced by the researchers to acknowledge and minimize the influence of their own biases and assumptions on the data collection and analysis.

## 4. Results

The thematic analysis of the interview transcripts revealed four main themes related to patients' experiences and perceptions of the impact of CMRs on their medication adherence and H

RQoL in KSA.

### 4.1 Theme 1: Improved Medication Understanding and Self-Management

Participants reported that the CMR helped them better understand their medications, including the purpose, proper use, and potential side effects of each drug. This increased knowledge and awareness enhanced their confidence and motivation to adhere to their treatment plans and engage in self-management activities.

*"Before the medication review, I was confused about some of my medications. I didn't know why I was taking them or how they worked. The pharmacist explained everything clearly and patiently, which made me feel more in control of my health." (Participant 8)*

*"The pharmacist showed me how to use my inhaler correctly and gave me tips on how to remember to take my medications on time. This made me feel more capable of managing my condition on my own." (Participant 15)*

### 4.2 Theme 2: Enhanced Therapeutic Relationships and Communication

Participants described the CMR as a positive and supportive interaction with the pharmacist, which fostered a trusting and collaborative therapeutic relationship. They appreciated the pharmacist's personalized attention, empathy, and communication skills, which made them feel heard, respected, and cared for.

*"The pharmacist was very friendly and approachable. She listened to my concerns and answered my questions in a way that I could understand. I felt comfortable sharing my experiences and challenges with her." (Participant 3)*

*"The medication review was different from my usual visits to the doctor. The pharmacist took the time to get to know me as a person, not just a patient. This made me feel valued and motivated to take better care of myself." (Participant 21)*

### 4.3 Theme 3: Positive Impact on Physical and Emotional Well-Being

Participants reported that the CMR had a positive impact on their physical and emotional well-being, which they attributed to the improved medication adherence and self-management resulting from the intervention. They described feeling healthier, more energetic, and less burdened by their chronic conditions.

*"After the medication review, I started taking my medications more regularly and following the pharmacist's advice on lifestyle changes. I noticed that my blood sugar levels were more stable and I had more energy throughout the day." (Participant 11)*

*"The pharmacist helped me identify and address some side effects I was experiencing from my medications. By adjusting my regimen and providing counseling, she helped me feel better both physically and emotionally." (Participant 27)*

#### 4.4 Theme 4: Barriers and Challenges to CMR Implementation

While participants expressed overall satisfaction with the CMR service, they also identified some barriers and challenges to its effective implementation in the KSA healthcare system. These included time constraints, limited access to pharmacists, and communication challenges.

*"The medication review was very helpful, but it took a long time. I had to wait for an appointment and then spend over an hour with the pharmacist. This may be difficult for people who have busy schedules or transportation issues." (Participant 19)*

*"I wish I could have more regular follow-up with the pharmacist after the initial medication review. However, it's not always easy to reach them or schedule additional consultations, especially if they work in a different healthcare setting." (Participant 7)*

*"Some of the information provided by the pharmacist was too technical or complex for me to fully understand. It would be helpful if they could use simpler language and provide written materials in Arabic for reference." (Participant 24)*

**Table 1. Summary of Themes and Sub-themes**

Theme	Sub-themes
Improved Medication Understanding and Self-Management	- Increased knowledge about medication purpose and use - Enhanced confidence and motivation for adherence - Engagement in self-management activities
Enhanced Therapeutic Relationships and Communication	- Positive and supportive interaction with pharmacist - Trusting and collaborative relationship - Personalized attention and communication
Positive Impact on Physical and Emotional Well-Being	- Improved medication adherence and self-management - Feeling healthier and more energetic - Reduced burden of chronic conditions
Barriers and Challenges to CMR Implementation	- Time constraints and appointment availability - Limited access to pharmacists for follow-up - Communication challenges and technical language

### 5. Discussion

The findings of this qualitative study provide valuable insights into patients' experiences and perceptions of the impact of CMRs on their medication adherence and HRQoL in KSA. The four themes that emerged from the analysis highlight the potential benefits and challenges of this service from the patient perspective.

#### 5.1 Improved Medication Understanding and Self-Management

The first theme suggests that CMRs can help patients better understand their medications and feel more confident and motivated to adhere to their treatment plans. This finding is consistent with previous research that has shown the positive impact of pharmacist-led educational interventions on patients' knowledge, attitudes, and behaviors related to medication use (Ong et al., 2018; Sanii et al., 2016). By providing clear and personalized information about medication purpose, proper

use, and potential side effects, pharmacists can empower patients to take an active role in their own care and engage in self-management activities (Mendu et al., 2019).

However, the effectiveness of CMRs in improving medication understanding and self-management may depend on the quality and clarity of the information provided, as well as the patient's health literacy and cognitive abilities (Shiyanbola et al., 2017). Pharmacists should use plain language, visual aids, and teach-back techniques to ensure that patients fully comprehend and retain the information provided during the CMR (Khong et al., 2018). They should also assess patients' health literacy and tailor their communication accordingly, using culturally appropriate and linguistically accessible materials (Singleton & Krause, 2009).

## **5.2 Enhanced Therapeutic Relationships and Communication**

The second theme highlights the importance of the patient-pharmacist relationship in the CMR process. Participants described the CMR as a positive and supportive interaction that fostered trust, collaboration, and open communication. This finding is consistent with the concept of patient-centered care, which emphasizes the importance of treating patients as partners in their own care and respecting their preferences, needs, and values (Epstein & Street, 2011).

Previous research has shown that patient-centered communication by healthcare providers, including pharmacists, is associated with better patient satisfaction, adherence, and health outcomes (Pinto et al., 2014; Sabater-Galindo et al., 2016). By providing personalized attention, empathy, and active listening, pharmacists can create a safe and supportive environment for patients to share their experiences, concerns, and goals related to their medication use and overall health (Alhusein et al., 2019). This can help build a strong therapeutic alliance that motivates patients to engage in self-care and adhere to their treatment plans (Müller et al., 2015).

However, the quality of the patient-pharmacist relationship may be influenced by various factors, such as the pharmacist's communication skills, cultural competence, and workload, as well as the patient's expectations, trust, and assertiveness (Aljudaimi & Arafah, 2018). Pharmacists should receive training in patient-centered communication and cultural sensitivity to effectively engage with diverse patient populations (Beach et al., 2006). They should also have adequate time and resources to provide individualized care and follow-up with patients after the initial CMR (Chia et al., 2021).

## **5.3 Positive Impact on Physical and Emotional Well-Being**

The third theme suggests that CMRs can have a positive impact on patients' physical and emotional well-being, which they attributed to the improved medication adherence and self-management resulting from the intervention. This finding is consistent with previous research that has demonstrated the association between medication adherence and HRQoL in various chronic conditions, such as diabetes, hypertension, and asthma (Boels et al., 2019; Wu et al., 2018).

By optimizing medication regimens, addressing side effects, and providing counseling on lifestyle modifications, pharmacists can help patients achieve better disease control and symptom management, which can translate into improved physical functioning, energy levels, and overall quality of life (Soprovich et al., 2019). Moreover, by providing emotional support and empowering patients to take charge of their health, pharmacists can help reduce the psychological burden and distress associated with chronic conditions (Bingham et al., 2018).

However, the impact of CMRs on patients' physical and emotional well-being may vary depending on the specific context and population. For example, patients with more severe or complex conditions, multiple comorbidities, or socioeconomic disadvantages may require more intensive and comprehensive interventions to achieve meaningful improvements in their health outcomes and quality of life (Haverhals et al., 2019). Pharmacists should collaborate with other healthcare providers, such as physicians, nurses, and social workers, to provide integrated and holistic care that addresses patients' diverse needs and challenges (Ramalho de Oliveira et al., 2010).

#### **5.4 Barriers and Challenges to CMR Implementation**

The fourth theme highlights some of the barriers and challenges to the effective implementation of CMRs in the KSA healthcare system, as perceived by the patients. These included time constraints, limited access to pharmacists, and communication challenges.

Time constraints and appointment availability were identified as major barriers to patients' participation in CMRs. This finding is consistent with previous research that has shown that patients' busy schedules, transportation difficulties, and competing priorities can hinder their ability to attend lengthy medication review sessions (Hindi et al., 2018). Pharmacists should explore flexible and convenient options for conducting CMRs, such as telehealth consultations, home visits, or group sessions, to accommodate patients' preferences and needs (Pellegrin et al., 2017).

Limited access to pharmacists for follow-up was another challenge reported by patients. This finding suggests that the continuity and coordination of care after the initial CMR may be suboptimal in some settings. Previous research has shown that ongoing monitoring, feedback, and support by pharmacists can enhance the long-term effectiveness and sustainability of medication adherence interventions (Conn & Ruppap, 2017). Pharmacists should establish clear communication channels and protocols for follow-up with patients and collaborate with other healthcare providers to ensure seamless and integrated care (Kooij et al., 2016).

Communication challenges, such as technical language and lack of written materials in Arabic, were also identified as barriers to patients' understanding and engagement in CMRs. This finding highlights the importance of providing culturally and linguistically appropriate health information and education to diverse patient populations (Singleton & Krause, 2009). Pharmacists should use plain language, visual aids, and translated materials to ensure that patients can fully comprehend and apply the information provided during the CMR (Khong et al., 2018).

#### **5.5 Implications for Practice and Policy**

The findings of this study have important implications for pharmacy practice and healthcare policy in KSA. They suggest that CMRs can be a valuable service for improving medication adherence and HRQoL among patients with chronic conditions, but their effectiveness may depend on various factors related to the patient, pharmacist, and healthcare system.

To optimize the impact of CMRs, pharmacists should receive training and support in patient-centered communication, cultural competence, and self-management support (Beach et al., 2006; Chia et al., 2021). They should also have access to adequate resources, such as time, space, and technology, to provide high-quality and personalized care to patients (Hindi et al., 2018; Pellegrin et al., 2017).

Healthcare organizations and policymakers should prioritize the integration of CMRs into routine care and ensure their accessibility and affordability to all patients who could benefit from them (Alsulaimi et al., 2021). This may require changes in reimbursement policies, workforce development, and interprofessional collaboration to support the expanded role of pharmacists in medication management and patient care (Aljudaibi et al., 2020; Messerli et al., 2016).

## **5.6 Limitations and Future Research**

This study has several limitations that should be acknowledged. First, the sample size was relatively small and recruited from a limited number of healthcare settings in KSA, which may limit the transferability of the findings to other contexts and populations. Future research should explore the experiences and perceptions of patients from diverse geographic, socioeconomic, and cultural backgrounds to gain a more comprehensive understanding of the impact of CMRs.

Second, the study relied on self-reported data from patients, which may be subject to recall bias or social desirability bias. Future research could use objective measures of medication adherence, such as electronic monitoring devices or pharmacy refill records, to corroborate patients' subjective reports (Stirratt et al., 2015).

Third, the study did not examine the perspectives of pharmacists or other healthcare providers involved in the CMR process. Future research should explore the experiences, challenges, and facilitators of CMR implementation from the provider perspective to gain a more holistic understanding of this service (Aljudaibi et al., 2020).

Finally, the study used a qualitative approach to explore patients' experiences and perceptions of CMRs, which does not allow for causal inferences or generalization of the findings. Future research could use quantitative or mixed-methods designs to examine the effectiveness and cost-effectiveness of CMRs in improving medication adherence, HRQoL, and other patient outcomes in KSA (Alsulaimi et al., 2021).

## **6. Conclusion**

This qualitative study explored patients' experiences and perceptions of the impact of CMRs on their medication adherence and HRQoL in KSA. The findings suggest that CMRs can help improve patients' medication understanding, self-management, and therapeutic relationships with pharmacists, which can translate into better physical and emotional well-being. However, patients also identified some barriers and challenges to the effective implementation of CMRs, such as time constraints, limited access to pharmacists, and communication challenges.

The findings of this study have important implications for pharmacy practice and healthcare policy in KSA. They highlight the need for patient-centered, culturally competent, and accessible CMR services that can support patients' medication adherence and quality of life. They also suggest that pharmacists should receive training and support in providing high-quality and personalized care to patients, and that healthcare organizations and policymakers should prioritize the integration of CMRs into routine care.

Future research should explore the perspectives of diverse patient populations and healthcare providers, use objective measures of medication adherence and health outcomes, and examine the effectiveness and cost-effectiveness of CMRs in different settings and contexts. By addressing these gaps and challenges, researchers, practitioners, and policymakers can work together to

optimize the impact of CMRs and improve the health and well-being of patients with chronic conditions in KSA.

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