

# The Expanding Role of Pharmacists in Chronic Disease Management in Saudi Arabia: Challenges and Opportunities

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## Abstracts

The prevalence of chronic diseases like diabetes, hypertension, and cardiovascular conditions poses the most significant public health challenges in Saudi Arabia. These characteristics further exacerbate lifestyle behaviors and healthcare-seeking practices and put pressure on the healthcare system. Pharmacists are now considered an integral element of chronic disease management, a role that extends beyond medication dispensing to encompass patient-centered care, education, and lifestyle counseling. The paper studies the development in the role of pharmacists within the Saudi health system, their role in chronic disease management, and some of the associated challenges-mainly regulatory restrictions, inadequate training, and restricted access to health records. Some recommendations have been suggested to support further integration and enhancement of the capacity of these health professionals in managing chronic diseases. In conclusion, opportunities for pharmacists in Saudi Arabia abound to expand their roles further in community health, in rural and marginalized districts. The key thrusts to enhance the roles of pharmacists in improving health outcomes among their communities include chronic disease management, patient education, improving clinical services, work-force balance, and patient confidentiality.

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**Keywords:** Chronic diseases, pharmacists, Saudi Arabia, healthcare, diabetes management, hypertension, patient-centered care, medication adherence, healthcare reform, Saudi Vision 2030.

## Introduction

Chronic diseases, such as diabetes, hypertension, and cardiovascular diseases, are on the increase and have become a public health concern in Saudi Arabia. A lot of aspects have fueled these conditions to rise alarmingly, such as bad eating habits, untimely sedentary lifestyle, and cigarette smoking. As for Saudi Health Information Survey by the Ministry of Health, it reveals that hypertension is within about 15.2% of the Saudi population, while the rate of diabetes is around 13.4%. Furthermore, the prevalence of obesity is 28.7%, and 39.8% of the population reported being sedentary, which increases the burden of chronic diseases (AlHabib et al., 2020). There has been an increasingly noticeable presence of chronic diseases in the Saudi society which is a health concern as well as it is making the health system heavier. The diseases are becoming more and more common, making their respective health care costlier, causing hospitalization, and the demand for health care. Chronic diseases are often linked to complications that require long-term management, thus further straining available health care resources. The age of Saudis with cardiovascular diseases is less than that of developed countries, which causes increased frequency of acute coronary syndrome and heart failure in their population (AlHabib et al., 2020).

This pattern calls for a change in how chronic conditions are managed owing to its growing prevalence. In addition, health-seeking behavior among Saudis is "retrospective but not proactive" to health. Patients habitually put diagnosis of their critical symptoms or even of serious conditions on delay for the current delay in diagnosis (Khalil et al, 2018), and therefore they are left longer and diagnosed at later stages. Realistic reactivity is a strong justification for why, based on literature, a social shift towards preventive medicine and health promotion is still in demand. The introduction of traditional and complementary medicines as a means to be used to improve disease control has recently been proposed as a tool for patient participation, in particular concerning diabetes (Alsanad et al., 2018). Saudi Arabia bears a heavy disease burden of chronic diseases, and it is a worrying trend that brings a large strain on the health care system. Considering the interaction between factors of lifestyle, mode of use of health services, and the accumulation of these morbidity-and-death diseases, at least one of the paths of multidisciplinary reform of the public health and health systems are worth the exploration. Addressing these challenges will require an interdisciplinary effort to support preventative health initiatives and increase health care accessibility (Asweto et al., 2022).

## Evolving Role of Pharmacists in Chronic Disease Management in Saudi Arabia

Pharmacists became a necessity for the management of chronic diseases within the Kingdom of Saudi Arabia, particularly diabetes, hypertension, and other cardiovascular conditions. This change follows the overall trends in health system development: patient needs and the active roles of pharmacists in team-based health systems. In the past pharmacist may be restricted in understanding himself predominantly as a dispenser of drugs. However, over the past few years,

there have been changes in the Saudi healthcare system which have given them a new focus on provision of patient care.

Community pharmacists are now part of the health service workforce and can contribute to managing chronic diseases through patient education, medication therapy management and the promotion of health (Khan et al., 2019). For instance, a diabetes education reinforcement project is an example of how community pharmacists could be involved in facilitating patients' participation in diabetes care, which can result in improved outcomes of diabetes care (Khan et al., 2019). This programme presented the reality and possibility of pharmacist-led teaching in chronic disease management, which will undoubtedly change the place of pharmacists in health care. Moreover, the role of the pharmacist has expanded to be able to involve a larger scope of clinical services. The pharmacy professional is now engaged in vaccination administration, patient training regarding the use of medical equipment, and medication therapy management (Almaghaslah, 2022). This is quite relevant particularly when using the instance of chronic disease care where continuous patient education and support are necessary for proper disease control. This has made the role of pharmacists much more significant during the time of COVID-19 because they assure patients of their delivery services and remote patient counseling at home (Almaghaslah, 2022).

The expectations of the healthcare consumers in Saudi Arabia have also changed, and now more patients are consulting pharmacists for the management of chronic diseases. It has been observed that consumers consider community pharmacists as significant contributors to patient health outcomes, especially for the prevention and monitoring of lifestyle-related diseases (Rasheed et al., 2020). This perception mirrors the increased recognition of pharmacists as accessible providers of health care who can make useful information and support to patients with chronic conditions. Additional initiatives include education to boost the clinical knowledge and competency of pharmacists to enable them to handle chronic diseases appropriately. For instance, training courses have been introduced in terms of skills in running diabetes clinics in a professional and empathetic approach with patients (Rasheed et al., 2023). Such education would find actual importance in creating an environment for collaborative healthcare that would allow pharmacists to meaningfully contribute to chronic disease management. In summary, pharmaceutical services in Saudi Arabia have undergone a transformation from the traditional dispensing function to comprehensive patient care in chronic disease management.

### **The Role of the Saudi Healthcare Framework in Shaping Pharmacists' Involvement in Chronic Disease Management**

The Saudi health structure is complex in influencing the participation of pharmacists in chronic disease management. Even though supportive elements exist within the system, however, several factors limit the full integration of pharmacists into this critical area in healthcare. One of the primary justifications for pharmacists' participation in the care of chronic diseases is the recognition of this role in patient-centered care. Currently, the Saudi healthcare system has been most receptive to the role of multidisciplinary teams who manage chronic diseases, including the pharmacist, as an integral member. This can be interpreted by looking at some of the initiatives that have been undertaken to reinforce the clinical functions of pharmacists. For instance,

Talal Jahaz Almutairi, Ameen Naeem Makhdoom, Yasir Hamad Alhaysuni, Fahad Mohammed S Alahmadi, Ahmad Manssor Aljohny, Mohammed Jeza Almutairi, Mostafa Bakheet Alsenani, Mona Falah Alanazi, Abeer Falah Alanazi, Shabab Zowied Obaid Almutiri, Jabri Zuwayyid Almutairi, Bayan Ghazi Alharbi, Majed Thabet Almotari, Salem Abdullah AlMohammadi, Majed Abdullah salem Al mohammadi medication therapy management programs and chronic disease management protocols (Rasheed et al., 2018). Such initiatives are intended to empower pharmacists through medication counseling with patient education on conditions such as diabetes and cardiovascular diseases (Rasheed et al., 2018).

Despite these developments, however, there is much still left to be desired. A systematic review revealed that the actual contribution of community pharmacies in chronic disease management is rather poor: many lack sufficient preparation to play their role properly in patient-centered care (Rasheed et al., 2018). That limitation is further heightened by the fact that, traditionally, people view pharmacists more as dispensers of drugs and less as active participants in disease management. The more general perception among the healthcare providers regarding the roles of pharmacists has evolved, and therefore, greater awareness and acceptance should be taken in understanding pharmacists as a part of the holistic healthcare team (Alomi et al., 2018).

Also, despite policies meant to increase the role of pharmacists, such as General Administration of Pharmaceutical's medication safety and pain management efforts, the execution and implementation of these policies are variable between regions and healthcare environments (Alomi et al., 2018). This leads to a variation in the scope of active participation pharmacists take in chronic disease management due to differences in regional health care implementations and scarce resources. Another crucial factor is that pharmacists need collaboration with other health professions. Research findings have indicated that doctors see potential in the contribution of pharmacists to the prevention services for cardiovascular diseases; however, the gap in collaborative practice still exists (Almansour et al., 2020). A national policy encouraging task sharing and collaboration between healthcare providers can enhance the role of pharmacists in chronic disease management, allowing them to take on tasks like health education and screening (Almansour et al., 2020).

## **The Role of Pharmacists in Chronic Disease Management in Saudi Arabia**

Pharmacists in Saudi Arabia have a key role in managing chronic disease, especially through counseling patients to adhere to therapy and modify lifestyles. Their functions, increasingly recognized today, are considered integral elements of a complete healthcare plan for the benefit of all patients.

### **Patient Counseling**

One of the key roles for a pharmacist is counseling. Community pharmacists are typically the most available health professional, and thus, play an important role in educating their patients about their drugs as well as chronic disease management. A systematic review revealed that despite being often consulted for health-related information, many community pharmacists do not provide medication counseling as well as health-related advice Rasheed et al. (2018). Indeed, the potential of medication therapy management (MTM) programs has shown promise in enhancing the counseling role of pharmacists. For example, a study showed that in a proposed MTM program that contained monthly counseling sessions and reviews, 96.3% of medication-related problems were resolved (Al-Haddad, 2019). This can mean that pharmacists may be of great use in addressing a patient's worry, especially in relation to medication management.

### Medication Adherence

Pharmacists also contribute much to promoting adherence among patients suffering from chronic diseases. They are in an ideal position to oversee the regimes of medication of patients and give advice that suits each patient's needs. Recent research has indicated that pharmacist-led interventions have a significant impact on increasing adherence, especially for chronic illnesses like diabetes and hypertension (Khan et al., 2019). Follow-up consultations by pharmacists and utilization of tools like drug synchronization will assist in creating an understanding among patients regarding the treatment plan, which needs to be strictly followed, rather than skipping prescribed therapies. In addition, pharmacist interventions are also documented nowadays, which helps in monitoring patients' response and adherence more effectively (Alomi et al., 2020).

### Lifestyle Changes

In addition to medication management, pharmacists are playing a key role in other lifestyle changes necessary in the management of chronic diseases. Counseling related to dietary modification, exercise, and smoking cessation remains essential components of chronic disease management. For example, an improvement program for diabetes education illustrated that pharmacists can engage patients in lifestyle modification-related discussions in favor of improving control of diseases (Khan et al., 2019). This proactive approach not only addresses the pharmacological aspect but also encourages patients to take hold of themselves by a well-informed choice.

**Table 1.** This table highlights the various challenges pharmacists face in managing chronic diseases in Saudi Arabia, underscoring areas for improvement to enhance their role in patient care.

Challenge	Description	Impact on Chronic Disease Management	Reference
Regulatory Limitations	Limited prescriptive authority and access to patient health records	Restricts pharmacists' ability to adjust medications or provide optimal care	Almaghaslah & Alsayari (2021); Miszewska et al. (2022)
Geographical Barriers	Uneven distribution of pharmacies, with fewer in rural areas	Limits access to pharmacist-led care in underserved regions	Almanasef (2023); Almaghaslah & Alsayari (2021)
Public Perception	Patients often view pharmacists primarily as dispensers, not as healthcare providers	Underutilization of pharmacists' services for chronic disease management	Almanasef (2023); El-Kholy et al. (2022)
Professional Training Gaps	Insufficient chronic disease management training in pharmacy education	Reduces pharmacists' readiness for patient-centered care	Madkhali & Alzahrani (2022)

Occupational Stress	Increased responsibilities and patient interaction stress	Potential burnout, impacting service quality	Almogbel (2021)
Healthcare System Integration	Limited integration of pharmacists into multidisciplinary healthcare teams	Reduces collaborative care potential for chronic conditions	Rasheed et al. (2018); Jun (2017)

**Barriers and opportunities**

Despite these contributions, the potential of pharmacists is still restricted by the many barriers of chronic disease management. Limited training and resources along with more traditional viewpoints about pharmacists' roles have continually hindered comprehensive delivery by pharmacists (Gillani et al., 2017). Furthermore, the health care framework in Saudi Arabia does not fully integrate the pharmacists into the chronic disease management process; therefore, they cannot play an active role in multidisciplinary teams (AlRuthia et al., 2018). However, the vital ongoing education programs and the policy changes that are being implemented to transform the role of pharmacists in the system of patient care apparently seem a promising step that would help in overcoming some of these challenges.

Conclusively, pharmacists in Saudi Arabia play significant roles in the management of chronic diseases by encouraging patient counseling concerning appropriate medication adherence and lifestyle changes. Despite such barriers, there is an opportunity for pharmacists to fill these roles increasingly with the changing healthcare environment.

**Contributions of Pharmacists to Chronic Disease Management in Saudi Arabia**

**Diabetes Education Programmes**

Among these studies is the report by Khan et al. that studied a program in which community pharmacists were included to supplement diabetes education in Saudi Arabia. Their findings were that the inclusion of pharmacists in diabetes education improved patient outcomes, such as improved handling of blood glucose as well as the active involvement of patients with their community pharmacists in health-related information Khan et al. (2019). This program was significant because it emerged as one of the first attempts in Saudi Arabia demonstrating the feasibility and even success of pharmacy-led diabetes education initiatives and underscores the potential role of pharmacists in the management of chronic diseases.

**Medication Therapy Management (MTM)**

Pharmacists have also shown increasing medication adherence through structured MTM programs. Pharmacist-led interventions have been evidenced to increase adherence for patients diagnosed with chronic diseases in a healthy way to be achieved in managing chronic disease. For example, a systematic review detected that pharmacist-led MTM showed a strong positive correlation with clinical outcomes, which includes glycemic control for patients suffering from diabetes (Assaf et al., 2022). These services comprise a comprehensive drug review, counseling

of patients, and follow-up consultation all integrated to collectively enhance patient understanding of the treatment regimens given.

### **Patient Perception and Satisfaction**

nowadays, it is found in Saudi and the attitude of people of Saudi towards pharmacy services as the research suggests by Almanasef (2023) stated: towards positive attitude of the people toward community pharmacy and their services. This transformation is also viewed with the growing awareness of a pharmacist role in the health care team, especially in managing chronic diseases. Moreover, according to the study conducted by Al-Haddad, despite the therapy management by community pharmacy services being at a relatively low level of satisfaction, perceptions toward community pharmacy services are becoming increasingly more positive. Meaning thereby that there is still room for further development and improvement of service delivery (Al-Haddad, 2019).

### **Role in Anemia Management**

There is evidence from various reports from pharmacists that they clearly understood their role in the self-management and drugs use of patients with specific chronic conditions such as anemia. According to Madkhali and Alzahrani, pharmacists found it essential to involve them in anemia management; however, this seems to be more a sign of pharmacist acceptance regarding their role in various chronic diseases management (Madkhali & Alzahrani, 2022). This aligns well with the body of literature indicating positive outcomes regarding chronic disease in patients who receive pharmacist interventions.

### **Documentation and Economic Impact**

Another area that has been focused on is the documentation of pharmacist interventions, such as in studies by Alomi et al., which recognized that actual documentation of pharmacist activities is vital for purposes of proof and demonstration of economic impacts pharmacists might have on healthcare outcomes (Alomi et al., 2020; Alomi et al., 2020). It gives recognition of better patient care and the services, which impact the general health system. In Conclusion, the evidence from Saudi Arabia highlights the critical contributions that pharmacists make to chronic disease management through educational interventions, medication therapy management, and patient support. These interventions achieve clinical benefits as well as enhancing patient satisfaction and perceptions of pharmacy services. Expansion in chronic disease management involvements is likely to be among the changing pharmacist roles and, thus, will be an expanded benefit for patient care in the Kingdom.

### **Expanding the Role of Pharmacists in Community Health in Saudi**

There is an enormous scope for pharmacists in Saudi Arabia to expand their role in community health, mainly in the rural or otherwise underserved parts. In fact, this is a required step in working towards bridging the gap in healthcare. Some key areas illustrating these large potential steps in developing contributions from pharmacists are discussed below.

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## **Chronic Disease Management and Preventive Services**

However, pharmacists have an important role to play both in the management of chronic diseases and preventive health services. According to Badreldin et al., dual degree programs, such as a Doctor of Pharmacy/Master of Public Health, could empower pharmacists to provide population-based care, which may include chronic disease management, health planning, and preventive services Badreldin et al. (2022). Such education will effectively arm pharmacists with the appropriate competencies to perform screenings on noncommunicable diseases, immunizations, and health promotion activities-more so in rural areas where access to healthcare providers may not be readily possible.

## **Patient Education and Counseling**

Community-based pharmacists are likely to be the most readily available healthcare providers, thus positioning them to deliver patient education and counseling. Khan et al. demonstrated that pharmacist-led diabetes education programs clearly improved patient outcomes and underscoring high levels of service demand (Khan et al., 2019). This could further extend these educational programs to other chronic illnesses like hypertension and asthma to improve the health literacy of the affected populations living in underserved communities to be well equipped to manage their own health.

## **Enhanced Clinical Services**

The shift towards patient-centered care in Saudi Arabia has also provided room for pharmacists to offer more enhanced clinical services. The public attitude towards services offered by community pharmacies is said to be friendly, which would indicate an upsurge in recognition of pharmacists as providers of healthcare services (Almanasef, 2023). Community pharmacies would offer health screenings, medication therapy management, and chronic disease monitoring, among other gaps noticed among the rural counterparts in healthcare delivery.

## **Work with Healthcare Providers**

The interconnection of pharmacists with other healthcare providers is fundamental to the formulation of interlinked care models targeting less privileged patients. Collaboration can be through information sharing, coordination of care plans, and engagement in multidisciplinary teams to effectively control chronic diseases. The collaborative efforts can improve care provision as well as guarantee effective provision of health services to the patients (Rasheed et al., 2018).

## **Workforce Shortages**

It has been pointed out that in Saudi Arabia, a big shortage of the qualified pharmacists exists, especially in the rural areas (Al-Tannir et al., 2016). The training of more pharmacists and motivating them to work in less serviced areas will help the healthcare system better serve such populations. Programs promoting recruitment and retention of pharmacists in the rural setting will be important for expanding access to pharmaceutical care.



## **Enhancing Privacy and Patient Satisfaction**

According to Khojah, confidentiality is very significant in community pharmacies practice regarding the enhancement of good communications and patient compliance. The upgrading of privacy in consultations enhances a pharmacist's confidence level, shifting the willingness of patients to seek advice and comply with treatment (Khojah, 2019). This is very important in rural areas since people are not willing to speak out regarding their health issues involving sensitive topics.

## **Opportunities for Pharmacists in Chronic Disease Management under Saudi Vision 2030**

The national healthcare reforms under Saudi Vision 2030 significantly open opportunities for pharmacists in chronic disease management. They target improvement in the quality of services, increased private sector participation, and positive health outcomes in the population. Several opportunities through which reform will arise for pharmacists in chronic disease management are discussed below.

### **Increased Private Sector Participation**

Key to this Vision 2030 is the encouragement for privatization in the healthcare sector to increase private sector input from 25% to 35% Rahman & Qattan (2021). Such a move is seen to boost the community pharmacies and the health facilities, thus raising the demand for pharmacists. With the constantly changing nature of the health care setting, pharmacists can play a more holistic role in the care of chronic diseases: management of medication, patient education, and lifestyle, especially targeting communities with limited access to health care services.

### **Preventive care with emphasis on chronic disease management**

Focus for 2030 advocates the role of preventive care and chronic disease management, an endeavor that falls within the pharmacists' competencies. The presence of pharmacists in chronic disease management programs opens avenues whereby these professionals can contribute their skills toward medication management and patient education to enhance health outcomes. Examples include pharmacist-led interventions in diabetes management, which have already demonstrated preliminary positive outcomes to better patient outcomes according to the report (Khan et al., 2019). Elongating such interventions can further widen the scope of role played by a pharmacist in chronic condition management, including hypertension and cardiovascular diseases.

### **Education and Human Resource Development**

The reforms further demand health professionals, like pharmacists, to advance their education and training. According to Alruthia et al., pharmacy programs need to enhance their educational outcomes in training pharmacists with the goal of providing broader care for chronic diseases (AlRuthia et al., 2018). Training and educating pharmacists ensure a competent workforce well prepared to perform the expanding role of care in chronic diseases.

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## **Public Awareness and Perception**

Public awareness campaigns that educate the community about the roles and capabilities of pharmacists in chronic disease management are also required. Many people fail to recognize the potential contributions of pharmacists as has been highlighted by several studies (El-Kholy et al., 2022). Vision 2030 presents an opportunity to implement education programs that highlight the role of the pharmacist in health care, thus enhancing increased engagement and utilization of pharmacy services for the management of chronic disease.

## **Regulatory Changes and Workforce Localization**

Vision 2030 aims to bring regulatory changes that build the local workforce towards healthcare, the community pharmacy included (Dali & Bawazir, 2022). This focus on "Saudization" may lead to a situation where there will be increased opportunities in working towards important positions in Saudi communities by both Saudi pharmacists. With increased numbers of Saudi pharmacists entering this profession, they shall be able to add to the management of chronic diseases issues in the rural and underserved regions.

## **Collaborative healthcare models**

The reforms support the development of collaborative models for healthcare with diverse types of health care providers, such as pharmacists, engaged in multidisciplinary teams. This approach would facilitate more effective management of chronic diseases because the management of such patients is holistic, encompassing medical treatment, lifestyle changes, and regular monitoring. Working with physicians and other health care professionals, pharmacists can, therefore, contribute to better patient outcomes. Accordingly, these national health care reforms under Saudi Vision 2030 are believed to offer vast opportunities for pharmacists in expounding their roles in chronic disease management. Strategies for greater participation of the private sector and preventive care, education enhancement, public awareness, regulatory changes, and collaborative healthcare models can be applied by pharmacists to enhance their roles in the health system while improving health outcomes in patients with chronic diseases in Saudi Arabia.

## **Role of Telepharmacy in Chronic Disease Management**

Advances in digital health, especially telepharmacy, are very supportive of pharmacists in managing chronic illnesses in the light of remote patient monitoring and follow-up. Telepharmacy into managing chronic disease will improve care by increasing accessibility for the service, improving communication, and providing opportunities to sustainably monitor patients' health status.

## **Better Access to Care**

A telepharmacy offers the ability for pharmacists to reach out to isolated or medically underserved locations. It is crucial in Saudi Arabia, where patients in rural locations may not have access to special healthcare services. Paudyal et al. opine that clinical pharmacist-led telemedicine services offer the potential of improving clinical outcomes among chronic disease patients by efficiently delivering public health services like counseling on adherence to medication and management of chronic diseases Paudyal et al. (2021). The service of

telepharmacy allows the provision of key services like medication reviews and health education by pharmacists without requiring patients to travel long distances.

### **Remote Patient Monitoring**

Telepharmacy allows remote monitoring of patients; thus, a pharmacist can monitor health metrics and adherence to medication in real time. Jackson et al indicated that telehealth interventions that incorporate pharmacists can utilize decision support tools to identify the patients whose medication regimen requires an adjustment thereby improving medication management Jackson et al., 2023). In chronic disease care, this means being able to intervene promptly when patients' health is deteriorating or if they have not adhered to their regimens.

### **Better Medication Management**

Telepharmacy may be used by pharmacists for the remote provision of medication therapy management (MTM). This may encompass evaluation of patients' medication lists, identification of possible drug-drug interactions, and education on safe medication use. Carr-Lopez et al. noted that "the emphasis given to access to personal health records as part of virtual care is expected to enhance the delivery of MTM services" (Carr-Lopez et al., 2020). Such services can, therefore, be performed via telepharmacy, thus ensuring that patients' medication adjustments are timely and appropriate, hence their overall health would improve.

### **Patient Engagement and Education**

Telepharmacy affords pharmacists an opportunity to engage the patient better in care. According to Isleem et al., tele-pharmacy services provide instant medical feedback and monitoring of physiological parameters that can positively impact the level of engagement and compliance a patient would have toward treatment protocols (Isleem et al., 2022). With digital means, pharmacists can educate patients about their conditions, treatments, and lifestyle modifications so that they can have a better control over health management.

### **Interoperability with other providers in healthcare**

Telepharmacy can also promote collaboration between pharmacists and other healthcare professionals to achieve a more integrated method of managing chronic diseases. According to Muflih et al., a pharmacist can communicate with a patient whenever and wherever it is possible and reduces possible barriers to access or improves coordination between providers (Muflih et al., 2021). This collaborative model would ultimately lead to improved quality of care for chronic conditions since the pharmacist could partner with the physician and other specialists in the design of more comprehensive care plans.

### **Evidence of Efficacy**

There are several studies that prove the success of telepharmacy in chronic condition management. For instance, systematic review by Crilly and Kayyali showed that the application of telehealth and digital technology by the community pharmacists led to enhanced public health outcomes, such as chronic disease management, (Crilly & Kayyali, 2020). This means that mHealth applications for remote monitoring have been promising, and their use should help in

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the management of hypertension, so it is evident that their use will regulate blood pressure by pharmacy-based interventions (Nelissen et al., 2018). In summary, the development of digital health, particularly telepharmacy, will arm pharmacists with important tools to add value to the provision of chronic illness services. Telepharmacy, in providing access to care, facilitating home monitoring, and facilitating effective communication, contributes significantly to better health outcomes for patients with chronic diseases.

## **Challenges Faced by Pharmacists in Chronic Disease Management**

Pharmacists in Saudi face several regulatory, logistical, and professional challenges when managing chronic diseases. They can delay or influence the ability of pharmacists in Saudi Arabia to provide optimal care and, therefore, full utilization of their expertise in chronic disease management.

### **Regulatory Challenges**

The regulatory framework governing pharmacy practice in Saudi Arabia can be complex and restrictive. According to Almaghaslah and Alsayari, the pharmacy regulatory bodies, including the Ministry of Health (MOH) and the Saudi Commission for Health Specialties (SCFHS), have issued various rules and regulations that can limit the scope of practice for pharmacists (Almaghaslah & Alsayari, 2021). For example, there is still a debate regarding the over-the-counter sales of drugs, and regulatory bodies are trying to exercise control on the effects over-the-counter medications pose on patient safety and chronic disease management (Khan & Ibrahim, 2012). Such regulatory framework means confusion for the pharmacists regarding their responsibility in chronic disease management.

### **Logistic Obstacles**

The logistical issues also affect the effective management of chronic diseases by the pharmacists. Most community pharmacies in Saudi Arabia are in urban settings, leading to inequitable access to pharmacy services for patients outside rural or underserved areas (Almanasef, 2023). Geographical limitations can thus become a significant barrier in the continuity of care and follow-up of chronic disease patients by pharmacists. Secondly, since there are insufficient local pharmacy graduates to fill available positions, it leads to overdependence on non-national pharmacists, which can influence the continuity and quality of care (Almaghaslah & Alsayari, 2021). With only a few pharmacy schools in the country, it means that there are unprepared workers who cannot stand the challenges presented in the management of chronic diseases (Madkhali & Alzahrani, 2022).

### **Professional Development and Training**

These authors conclude that there is a need for improvement around education and training of pharmacists. Pharmacy schools often do not prepare graduates well enough to handle the complex issues involved in chronic disease management, according to Madkhali and Alzahrani (2022). New pharmacists are not adequately prepared with practical training in community pharmacy settings, which may place them in an uncertain state regarding their ability to provide comprehensive care for chronic conditions. Additionally, ongoing training or professional

development opportunities are important to keep abreast of the best practice in chronic disease management, though such training may not be available to all pharmacists.

**Table 2.** Evolving Roles of Pharmacists in Chronic Disease Management in Saudi Arabia.

Role of Pharmacist	Key Contributions	Outcomes & Impact	Reference
Patient Education	Diabetes education programs	Improved diabetes outcomes	Khan et al. (2019)
Medication Therapy Management	Medication review and counseling	Enhanced medication adherence, improved health	Almaghaslah (2022)
Vaccination Administration	Immunizations and training on medical devices	Increased healthcare access and support during COVID-19	Almaghaslah (2022)
Health Promotion	Counseling on lifestyle modifications	Reduced chronic disease risk	Rasheed et al. (2023); Rasheed et al. (2020)
Training Programs	Skills for diabetes clinics	Preparedness for pharmacist-led chronic care	Rasheed et al. (2023)

### Public Perception and Utilization of Services

The way the public perceives and utilizes the services provided by pharmacists constitutes a significant challenge. Almanasef performed a study revealing that although community pharmacists are commonly consulted for health-related information, the public still lacks substantial knowledge about the types of services available from them (Almanasef, 2023). Limited awareness may hence lead to underuse of pharmacy services in the management of chronic diseases because patients might not seek pharmacists who could otherwise help serve them.

### Satisfaction with Pharmacy Services

Research has indicated that patient satisfaction with community pharmacy services in Saudi Arabia remains low at times. Al-Haddad revealed that a substantial number of patients were dissatisfied with the therapy management service offered by community pharmacists (Al-Haddad, 2019). This dissatisfaction may arise due to inadequate counseling, poor follow up and poor involvement in chronic disease management, thus ultimately affecting patient outcomes.

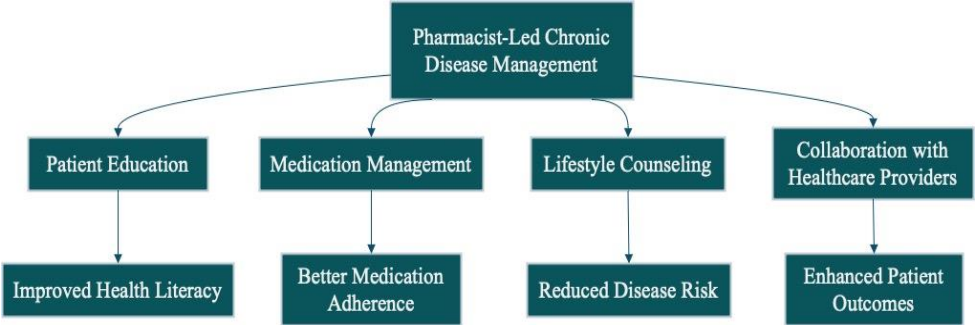
### Occupational Stress and Work Environment

Occupational stress is also a challenge among pharmacists working in Saudi Arabia, which could affect their performance and job satisfaction. Almogbel clarified that the current day pharmacist role, transforming from only dispensing drugs to engaging with direct patient care, leads to increased pressure and workplace stress (Almogbel, 2021). Occupational stress may, therefore, hinder chronic disease management by pharmacists since they may become burdened by their roles.

**Conclusion** In this paper, the regulatory and logistical challenges, and in particular professional

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challenges, that pharmacists face in Saudi Arabia can impede their capacity to manage patients with chronic diseases effectively. Strategies to overcome these challenges lie in better regulations and training programs, public awareness campaigns, and enhancement of professional skills development for the profession.



**Figure. 1.** This diagram illustrates the core activities performed by pharmacists in managing chronic diseases and their associated positive outcomes, including improved literacy, adherence, risk reduction, and enhanced care coordination.

**Challenges in Prescriptive Authority and Health Record Access for Pharmacists in Chronic Disease Management**

Limitations in prescriptive authority and access to patient health records heavily impact Saudi pharmacists in the ability to provide holistic chronic disease care. Such limitations deny them their ability to deliver optimal patient outcomes and adequately utilize their clinical expertise.

**Limitations in Prescriptive Authority**

A pharmacist in Saudi Arabia is not allowed to prescribe or change the treatment regimen of chronic diseases alone. Instead, this is allowed in other countries where pharmacists are qualified to prescribe drugs under a CPA or with autonomous prescribing power (Miszewska et al., 2022). Since such authority is not available in Saudi Arabia, the patients must rely upon physicians for prescribing medications while delaying the care of the patient and limiting the role of the pharmacist during the management of chronic conditions. For example, in countries in which pharmacy prescriptive authority exists, it has been demonstrated that pharmacists are able to attain comparable clinical results to doctors in the care of chronic diseases, including increased patient compliance with medications and patient satisfaction (Miszewska et al., 2022). The Saudi Arabian limitation of no prescriptive authority for pharmacists bars these professionals from proactively contributing towards the management of patients, consequently lowering the effectiveness of care given to chronic diseases.

**Access to Patient Health Record**

Access to patient health records is of utmost importance for pharmacists to provide holistic care as this enables them to have a review of drug histories, monitor the treatment outcome, and make informed recommendations. However, access of EHRs in Saudi Arabia still remains hindered by

regulatory provisions, along with healthcare information systems not being uniform or fragmented in nature (Burns, 2016). Lack of full patient records may lead to pharmacists not being able to adequately analyze their appropriateness in medication use, detect impending drug interactions, or monitor chronic diseases. This, therefore, limits the management of patients and places them at greater risk for adverse drug events.

### **Impact on Collaborative Care**

Inability to prescribe medications and limited access to health records can constrain the collaborative care model that is central in the effective management of chronic diseases. In settings where pharmacists share office space with physicians and access the EHRs, they would be integrated in ensuring a good management of chronic diseases, especially through adjustment of medication, patient education, and monitoring of health outcomes (Jun, 2017). Therefore, this structure may not facilitate such collaboration in Saudi Arabia, and thus, provides disjointed care to patients, who may not receive adequate interventions in managing chronic diseases.

### **Professional Development and Training**

The professional development of the pharmacist is further affected by the limits of prescriptive authority and access to health records. Without a chance to provide prescribing practices or access data for patients, pharmacists may not fully develop the necessary skills that allow for effective chronic disease management. Underutilization of the pharmacist in healthcare tends to simply get tangled in a cycle because pharmacists are not viewed as an integral part of the healthcare team (Adams & Weaver, 2016).

### **Patient Outcomes**

Ultimately, these limitations may negatively impact patient outcomes during chronic disease management. Observations were made with direct patient care, including medication management and education, wherein evidence demonstrated significant improvement in clinical outcomes such as better control of blood pressure and blood glucose (McNamara et al., 2019). In Saudi Arabia, without prescription and access to clients' health records, pharmacists may fail to yield the same outcomes.

In general, prescriptive authority and access to patient health records are critical limitations for pharmacists in Saudi Arabia. This challenges the efficient management of chronic diseases and calls for reform in regulations and improved access to health information systems as effective ways to improve the role of pharmacists in chronic disease management towards improvements in patient outcomes.

### **Conclusion**

Chronic diseases make Saudi Arabia increasingly face a challenge in the context of health care. The growing importance of pharmacists in managing chronic conditions has been proven through education, medication therapy management, and lifestyle counseling. There are even challenges from regulatory limitations, training gaps, and public perception. An opportunity can be created by Saudi Vision 2030 to overcome these barriers through preventive care, education and training

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#### Author contributions

Study Commencement, Investigation, and Manuscript original draft preparation: First Author; Supervision and Methodology implementation: Corresponding author and first author. Manuscript Editing, Review, Data collection and Data in a tabular form: All co-authors. Manuscript text editing and final approval of manuscript: All participating authors.

#### Conflict of Interest

The authors declare no conflict of interest, financial or otherwise.

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#### Ethical Approval

Approved by institutional Review Board (IRB), General Directorate of Health Affairs in Madinah, National Registration Number with NCBE-KACST, KSA: (H-03-M-84), IRB log No: 2G135.

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