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Determining the Role of Pharmacist in Cardiovascular Disease-Related Health Promotion and in Hypertension and Dyslipidemia Management: A Cross-Sectional Study in Lahore, Pakistan

Tabinda Razzaq [a++], Raza Hanif [a#], Muhammad Haris Pervaiz [a†], Shehzada Muhammad Afaq Raza [a‡], Samar Zia [a‡], Mahgull Mahmood [a‡], Muhammad Shahmir Ahsan [a‡], Rania Ahmad [a‡], Mohammad Abdullah [a‡], Wasaeia Riaz [a‡], M. Hassan Fayyaz [a‡*] and Muhammad Zahid Iqbal [a^]

[a] Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Lahore University of Biological & Applied Sciences, Lahore, Pakistan.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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[++] *Research Project Supervisor;*
[#] *Group Lead 1, Research Student;*
[†] *Group Lead 2, Research Student;*
[‡] *Research Student;*
[^] *Research Project Co-Supervisor;*
**Corresponding author: E-mail: hassanfayyaz550@gmail.com;*

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ABSTRACT

Background: Globally, cardiovascular diseases (CVDs) continue to be the primary cause of morbidity and mortality. Conditions including dyslipidemia, ischemic heart disease (IHD), and stroke play a significant role in this regard. Community pharmacists are essential in promoting health, especially when controlling risk factors like dyslipidemia and hypertension. However, little is known about community pharmacists' involvement in these initiatives in Pakistan, especially in Lahore.

Objective: This study aimed to determine how involved community pharmacists in Lahore are in CVD-related health promotion initiatives and to analyze how they manage hypertension and dyslipidemia.

Methods: This study is cross-sectional research conducted from May to August 2024—a self-structured questionnaire validated by experts with a Cronbach's value of 0.7291 is utilized for this study. The sample size was 113, determined by the convenient sampling method. The questionnaire included demographics, participation in cardiovascular health promotion, hypertension care services, and dyslipidemia care services. SPSS version 26 was used for the statistical analysis

Results: In a study of 113 community pharmacists in Lahore, 53.1% were from the age group of 26-35 years, and only 2% were over 45. The study assessed pharmacists' roles in cardiovascular health promotion and management of hypertension and dyslipidemia. Findings revealed that 61.1% of pharmacists consistently counsel patients on healthy lifestyles, while 43.4% regularly educate patients about potential adverse drug reactions. However, only 22.1% of pharmacies offered diagnostic tests for dyslipidemia. The study highlights pharmacists' critical yet varied involvement in cardiovascular disease prevention and management.

Conclusion: In this study, improved behavior was seen by the pharmacists as most of them always provide services to promote health in CVD patients and management of hypertension and dyslipidemia.

Keywords: Cardiovascular diseases; hypertension management; dyslipidemia management; health promotion; community pharmacist; pharmaceutical care; risk factors; pharmacist intervention; medication adherence.

1. INTRODUCTION

Cardiovascular diseases (CVD) encompass a broad range of disorders affecting the heart and blood vessels, making them the leading cause of morbidity and mortality worldwide [1]. Conditions under this umbrella term include coronary artery disease, heart failure, arrhythmias, and stroke, each significantly contributing to global health burdens [2]. The main types of CVDs responsible for this burden are ischemic heart disease (IHD), stroke, congestive heart failure (CHF), hypertension, and dyslipidemia [3,4]. Cardiovascular diseases rank among the top ten causes of illness and death globally, underscoring the urgency of addressing this public health challenge [5].

The development of CVD is significantly influenced by various interrelated risk factors, including smoking, hypertension, elevated blood sugar levels, lipid irregularities, obesity, and physical inactivity [5]. These factors often compound each other's effects, increasing the overall risk. Globally, the death toll from cardiovascular disease has risen significantly, from 12.4 million in 1990 to 19.8 million in 2022 [6]. This increase reflects the combined impact of population growth, aging, and preventable metabolic, environmental, and behavioral risks. Moreover, between 2015 and 2022, age-standardized mortality rates for cardiovascular disease increased in 27 out of 204 locations, indicating the persistent challenge of managing CVD across diverse regions [6].

Hypertension, defined as raised blood pressure, is one of the most significant risk factors for CVD. A patient is considered hypertensive if his systolic blood pressure exceeds 140 mm/Hg or his diastolic blood pressure exceeds 90 mm/Hg [7]. Factors such as physical inactivity, poor diet, aging populations, and social anxiety contribute to the growing hypertension burden, particularly in developing countries. A systemic analysis showed that approximately 1.39 billion people worldwide were suffering from hypertension in 2010, with low- and middle-income countries accounting for about 1.04 billion patients [8]. In contrast, high-income countries had about 349

million patients, and the prevalence of hypertensive patients increased by 7.7% in low- and middle-income countries while decreasing by 2.6% in high-income countries from 2000 to 2010 [8].

Dyslipidemia, another critical risk factor, is a significant predictor of atherosclerotic cardiovascular disease, contributing to approximately one-third of all deaths globally [9]. Dyslipidemia refers to abnormal lipid levels in the bloodstream, including elevated low-density lipoprotein (LDL) cholesterol, reduced high-density lipoprotein (HDL) cholesterol, and elevated triglycerides. These lipid imbalances can severely impact heart health and overall well-being. The World Health Organization (WHO) reports that high cholesterol accounts for one-third of all heart attacks globally, leading to 2.6 million deaths annually. Studies indicate that even teenagers and young adults with high cholesterol, obesity, and other risk factors already show signs of artery disease, underscoring the importance of early cholesterol assessment [10].

Pharmaceutical care, as redefined by the International Pharmaceutical Federation (IPF), aims to achieve outcomes that improve or maintain patients' quality of life [11]. Community pharmacists in both industrialized and developing countries, due to their accessibility and affordability, often serve as the initial point of contact within healthcare systems [5]. Although prescribing and modifying prescriptions are primarily the responsibility of physicians, pharmacists play a crucial role by providing clinical knowledge and advice to ensure safe and effective medication use in patients with CVD [12].

Community pharmacists are uniquely positioned to collaborate with other healthcare professionals, such as nurses, therapists, and nutritionists, to monitor cholesterol and blood pressure levels and provide dietary advice [13]. Multiple studies have confirmed the effectiveness of pharmacists' interventions in preventing and controlling CVD. For example, community pharmacists in Saudi Arabia have demonstrated a deep understanding of CVD risk factors [14]. By assisting patients in managing blood pressure and dyslipidemia, pharmacists contribute to positive health outcomes and help reduce the incidence of cardiovascular diseases [1].

While numerous studies related to cardiovascular diseases have been conducted in Pakistan, none have clearly elucidated the role of pharmacists in managing CVD, hypertension, and dyslipidemia patients. Although similar studies have been conducted in countries like Malaysia and Qatar, this type of research has not been carried out in Pakistan. Therefore, this study aims to assess the degree of involvement of community pharmacists in Lahore in health promotion activities related to cardiovascular diseases and to evaluate their role in managing risk factors for cardiovascular diseases, particularly hypertension and dyslipidemia.

2. METHODOLOGY

The study design was cross-sectional and conducted over five months, from May 2024 to August 2024, to investigate the role of community pharmacists in activities related to cardiovascular diseases and the management of hypertension and dyslipidemia. This study was done in different pharmacies (n=113) in Lahore. The sample size was calculated on the basis of convenient sampling [15]. A self-structured questionnaire validated by independent experts was utilized for this study, and it had a 0.7291 Cronbach's alpha value. Data was collected by a team of students pursuing Pharm D who had proper knowledge about data collection. The study was a survey that did not include any intervention, so ethical consideration is not required. However, we obtained written consent from the participants after explaining the purpose of the study and ensuring their privacy and confidentiality. The questionnaire consisted of four portions i.e., the first one was about the demographics, the second portion had questions related to the Current involvement of community pharmacists in cardiovascular disease-related health promotion activities, the third one was related to hypertension care services, and the last one was about the dyslipidemia care services. A total of 141 local pharmacies were visited, out of which 21 pharmacies did not have a community pharmacist. In 07 pharmacies, the community pharmacist did not agree to participate in the ongoing research. The study population consisted of 113 pharmacies in Lahore. The study included pharmacies where the pharmacist was present, and they were willing to participate and provide information regarding their practices. Incomplete responses were excluded from the study.

2.1 Statistical Analysis

The experimental data were presented in both descriptive and analytical formats, with

statistical analysis performed using SPSS version 26.0. A significance threshold of $P < 0.05$ was set to determine statistical significance.

3. RESULTS

In a study involving 113 community pharmacists from different pharmacies in Lahore, about 53.1% of participants were in the bracket of 26-35 years old, and only 2% of pharmacists were older than 45 years.

The study evaluates the role pharmacists play in promoting cardiovascular disease-related health and managing hypertension and dyslipidemia. Table 1 gives the demographic data of pharmacists:

Table 1. Represents the demographic information of the pharmacists (N=113)

Age in years	
15-25 years	45 (39.8)
26-35 years	60 (53.1)
36-45 years	6 (5.3)
More than 46 years	2 (1.8)
Gender	
Male	63 (55.8)
Female	50 (44.2)
Year Of Graduation	
2000-2005	2 (1.8)
2006-2010	2 (1.8)
2011-2015	4 (3.5)
2016-2020	43 (38.1)
2021-2025	62 (54.9)
Time of Employment	
Full Time	97 (85.8)
Part-Time	16 (14.2)
Number Of Pharmacists	
1	87 (77.0)
More than 1	26 (23.0)
Year Of Practice	
Less than 5 years	91 (80.5)
6-10 years	17 (15.0)
11-20 years	3 (2.7)
More than 20 years	2 (1.8)
Monthly Income	
Less than 30,000	36 (31.9)
31,000-60,000	43 (38.1)
61,000-90,000	27 (23.9)
More than 90,000	7 (6.2)
Have you ever participated in continuing education programs related to cardiovascular disease management?	
Yes	58 (51.3)
No	55 (48.7)
Are you interested in participating in continuing education programs related to cardiovascular disease management?	
Yes	100 (88.5)
No	13 (11.5)
Do your immediate family members have cardiovascular disease?	
Yes	54 (47.8)
No	59 (52.2)

Number of prescriptions on a workday?	
Less than 30	27 (23.9)
30-100	54 (47.8)
101-300	18 (15.9)
Greater than 300	14 (12.4)
Percentage if patients with cardiovascular disease?	
0-25%	29 (25.7)
26-50%	60 (53.1)
51-75%	22 (19.5)
76-100%	2 (1.8)
Availability of hypertensive agents (e.g., thiazide, ACE inhibitors, ARBS, CCBs) in the pharmacy	
Yes	109 (96.5)
No	4 (3.5)
Availability of anti-dyslipidemia agents (e.g., statins, fibrates, niacin, BARs) in the pharmacy	
Yes	110 (97.3)
No	3 (2.7)
Availability of hypertension-related supplies, e.g., blood pressure monitoring devices in the pharmacy	
Yes	111 (98.2)
No	2 (1.8)
Availability of dyslipidemia/CVD diagnostic tests in the pharmacy	
Yes	25 (22.1)
No	88 (77.9)

Demographic data showed that the percentage of male pharmacists (55.8%) was more than that of female pharmacists (44.2%) in community pharmacies, and about 77% of pharmacies had only one pharmacist hired by the management. Mixed results were seen when asked about participation in continuing education programs. Almost every pharmacist ensured the presence of antihypertensive agents, anti-dyslipidemia agents, and supplies to monitor the blood pressure of patients, but only about 22.1% had diagnostic tests available for dyslipidemia. More details can be found in Table 2 below.

Table 2. Involvement of Pharmacists in health promotion activities related to cardiovascular diseases (N= 113)

Questions	Never	Rarely	Often	Always
Provide educational materials to patients for preventing cardiovascular diseases and managing dyslipidemia and hypertension.	12 (10.6)	43 (38.1)	33 (29.2)	25 (22.1)
Educate patients to use cardiac risk evaluation tools for self-assessing heart disease risk factors.	13 (11.5)	37 (32.7)	31 (27.4)	32 (28.3)
Collaborated with healthcare professionals to screen patients for cardiovascular disease risk factors, including hypertension and dyslipidemia	26 (23.0)	40 (35.4)	33 (29.2)	14 (12.4)
Counsel patients on maintaining a healthy lifestyle to prevent cardiovascular diseases.	2 (1.8)	10 (8.8)	32 (28.3)	69 (61.1)
Educate patients on the importance of early identification of risk factors like dyslipidemia and hypertension in managing cardiovascular diseases.	6 (5.3)	21 (18.6)	41 (36.3)	45 (39.8)

Around 61.1% of pharmacists said they always counsel patients on maintaining healthy lifestyles to prevent cardiovascular disease, and only 1.8% said they never counsel

Table 3. Hypertension Care Services (N= 113)

Questions	Never	Rarely	Often	Always
Monitor the drug therapy adherence of hypertensive patients	8 (7.1)	18 (15.9)	44 (38.9)	43 (38.1)
Educate the patient about possible adverse drug reactions of the therapy	8 (7.1)	25 (22.1)	31 (27.4)	49 (43.4)
Suggest a doctor to the patient for maintaining blood pressure in the range.	8 (7.1)	17 (15.0)	40 (35.4)	48 (42.5)
Educate patients on the causes, signs, symptoms, and treatment of hypertension	5 (4.4)	4 (3.5)	40 (35.4)	64 (56.6)
Advise patients to quit smoking. Where applicable	2 (1.8)	6 (5.3)	18 (15.9)	87 (77.0)

When asked about educating the patients on possible adverse drug reactions to the therapy, 43.4% of pharmacists agreed that they always give this service to the patient, and only 7.1% said they never educate the patient

Table 4. Dyslipidemia Care Services (N= 113)

Questions	Never	Rarely	Often	Always
Educate the patients on the importance of routine lab testing of blood lipids/cholesterol level	4 (3.5)	21 (18.6)	42 (37.2)	46 (40.7)
Evaluate the blood lipids/cholesterol value that deviates from the desired range	5 (4.4)	21 (18.6)	53 (46.9)	34 (30.1)
Suggest a doctor with better medication therapy recommendation for the maintenance of blood lipids/ cholesterol levels between a desired range	8 (7.1)	22 (19.5)	42 (37.2)	41 (36.3)
Explain possible advantages of anti-dyslipidemia drugs	3 (2.7)	23 (20.4)	40 (35.4)	47 (41.6)
Educate the patient about possible adverse drug reactions of the therapy	4 (3.5)	21 (18.6)	43 (38.1)	45 (39.8)

For better therapy adherence, 41.6% of pharmacists said they always explain to the patient the advantages of anti-dyslipidemia drugs, 35.4% said they often, 20.4% agreed they rarely explain this, and only 2.7% said they never explain the advantages of anti-dyslipidemia drugs

4. DISCUSSION

This study highlights how important community pharmacists in Lahore are to the management of cardiovascular diseases (CVDs), especially when it comes to promoting health, controlling hypertension, and managing dyslipidemia. The critical role that pharmacists play in promoting health related to CVDs is significant as the burden of these diseases is rising globally and in Pakistan. This is the first study in Pakistan to evaluate the role pharmacists play in the promotion and management of cardiovascular disease, as well as the promotion and management of hypertension and dyslipidemia. In the current study, 22.1% of pharmacists always provided educational materials to patients for preventing cardiovascular diseases and managing dyslipidemia and hypertension. In another study conducted in Qatar in 2015, only 8 (6.1%) pharmacists always provided educational materials to patients [5].

The study reveals that a majority (61.1%) of pharmacists consistently counsel patients on maintaining a healthy lifestyle to prevent CVDs. This is encouraging, as lifestyle modifications such as diet and exercise are vital in reducing the risk of heart disease and stroke [5]. However, the relatively lower involvement in providing educational materials and using cardiac risk evaluation tools (22.1% and 28.3%, respectively) suggests that there is room for improvement in how pharmacists engage with patients in preventive care. These findings align with global trends, where pharmacists are increasingly recognized as vital contributors to public health but often face challenges in maximizing their impact due to limited resources and training.

The pharmacist's hypertension management services were appreciated in the current study. When the question was asked the pharmacists about educating the patient on the adverse drug reactions of antihypertensive drugs, 43.4% of pharmacists responded that they always

educated the patient. In comparison, 7.1% of pharmacists responded that they never provided education to patients regarding adverse drug reactions of antihypertensive drugs. These results were in contrast with the findings of research conducted in Qatar, in which only 26.7% of pharmacists always adhered to this service and 5.8% never educated patients [5].

In the current study, 38.1% of pharmacists monitored the drug therapy adherence of hypertensive patients, which depicts that it can be improved further by incorporating pharmacist's intervention such as patient education and counseling about lifestyle, medication and medication adherence, blood pressure measurement, medication management, reminder system, and health care professional training. In another study, larger blood pressure reductions were observed following a pharmacist's intervention, particularly if this was led directly by the pharmacist, without co-management, and done at least monthly [16].

The study highlights mixed results regarding the pharmacists' involvement in hypertension and dyslipidemia management. For hypertension, 43.4% of pharmacists reported consistently educating patients about possible adverse drug reactions, while only 7.1% never provided such education. This indicates that while many pharmacists are actively involved in patient education, a significant minority may require additional training or resources to support their patients fully. Similarly, in dyslipidemia care, 41.6% of pharmacists regularly explained the advantages of anti-dyslipidemia drugs, suggesting that while awareness of the importance of medication adherence is high, there is still a need for more consistent patient engagement.

Mixed results were seen when the question was asked if pharmacists evaluate the blood lipids/cholesterol values that deviate from the desired range, as 30.1% of pharmacists always assessed the lipid/cholesterol value, 46.9% of pharmacists often look for the deviation in the normal range of values and only 4.4% of pharmacist never assessed the desired range of values. Variable results were found when asked if they ever suggest a doctor with better medication therapy recommendations for maintaining blood lipids/ cholesterol levels between a desired range [5].

Our study showed better results and improved pharmacist behavior in its role and duties towards the patients compared with similar previous studies conducted in [1] and in Qatar [5]. It is a positive sign that pharmacists now show better behavior, but there is still room for further improvement.

5. CONCLUSION

This study highlights the essential role of community pharmacists in Lahore in managing cardiovascular diseases (CVDs), mainly through health promotion activities and managing hypertension and dyslipidemia. While pharmacists actively counsel patients on lifestyle modifications and medication adherence, there are significant gaps in the availability of diagnostic services for dyslipidemia and continuing professional development. Strengthening the role of pharmacists through enhanced access to training and diagnostic tools could further improve patient outcomes and reduce the burden of CVDs in Pakistan. Addressing these challenges will require coordinated efforts between healthcare providers, policymakers, and educational institutions to empower pharmacists and optimize their contributions to cardiovascular health management.

6. LIMITATIONS OF THE STUDY

This study only involves the community pharmacists working in pharmacies in Lahore and doesn't cover any pharmacists in pharmacies outside of Lahore. A similar study should be conducted all over Pakistan.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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