VER
Vascular & Endovascular Review

Descriptive Analysis of Type 2 Diabetes, Hypertension, and cardiovascular diseases: Patterns, Treatment Approaches, and Barriers to Effective Chronic Disease Management

Guntaka Ramachandra Reddy[1*], Dr. N. Deepa[1]

[1*]Research scholar/Associate professor, Department of Pharmacology, Faculty of Pharmacy, Sree Balaji Medical college Hospital, Chromepet Chennai, (Affiliated to Bharat institute of Higher Education and Research, Chennai), India.
[1]Dean, Faculty of Pharmacy, Sree Balaji Medical college Hospital, Chromepet Chennai, (Affiliated to Bharat institute of Higher Education and Research, Chennai), India.

ABSTRACT

Background: Non-communicable diseases (NCDs) such as Type 2 Diabetes Mellitus (T2DM), hypertension, and cardiovascular diseases (CVDs) are leading causes of morbidity and mortality worldwide. These chronic conditions often coexist and share common risk factors, contributing significantly to healthcare burdens, particularly in low- and middle-income countries. A descriptive analysis of their prevalence, treatment patterns, and barriers to management provides essential insight for health policy and service optimisation. Objective: This study aimed to analyse demographic and clinical patterns, treatment modalities, and healthcare challenges among patients and professionals managing T2DM, hypertension, and CVDs. Methods: A cross- sectional, descriptive study was conducted among 386 participants including healthcare professionals, policymakers, and pharmaceutical industry personnel. A validated questionnaire was used to collect data on demographics, professional experience, disease types, treatment regimens, and perceived barriers. Data were analysed using descriptive statistics and visualised through 3D bar graphs. Results: The majority of patients were male (59%) and aged between 46– 60 years. Type 2 Diabetes was the most prevalent condition (46.1%), followed by hypertension (34.2%) and other CVDs (19.7%). Metformin, ACE inhibitors, and statins were commonly prescribed. Key barriers identified included high treatment costs, poor access to specialised care, lack of awareness of health schemes, and limited patient education. Systemic issues such as policy delays and medication stock-outs further hampered care. Conclusion: Comprehensive strategies addressing financial, infrastructural, educational, and systemic gaps re essential for improving chronic disease management and promoting equitable healthcare delivery.

KEYWORDS: Type 2 Diabetes Mellitus, Hypertension, Cardiovascular Diseases, Descriptive Analysis, Healthcare Barriers, Chronic Disease Management.

How to Cite: Guntaka Ramachandra Reddy, N. Deepa., (2025) Descriptive Analysis of Type 2 Diabetes, Hypertension, and cardiovascular diseases: Patterns, Treatment Approaches, and Barriers to Effective Chronic Disease Management, Vascular and Endovascular Review, Vol.8, No.9s, 267--276.

INTRODUCTION

Non-communicable diseases (NCDs) such as Type 2 Diabetes Mellitus (T2DM), hypertension, and cardiovascular diseases (CVDs) represent a significant and growing global health concern, particularly in low- and middle-income countries. These conditions are interrelated in both pathophysiology and risk factors, often coexisting and compounding each other's impact on an individual's health (1). The increasing prevalence of these chronic diseases is largely attributed to sedentary lifestyles, poor dietary habits, urbanisation, population ageing, and genetic predispositions (2). As the world continues to shift towards industrialised living and longer life expectancy, the burden of chronic diseases is expected to rise, placing immense strain on healthcare systems and economies. Therefore, understanding the descriptive epidemiology of these conditions—how they vary across different population groups in terms of age, gender, geography, and socioeconomic status—is crucial in formulating targeted public health interventions and policies (3).

Type 2 Diabetes Mellitus is characterised by insulin resistance and a relative lack of insulin secretion, leading to chronic hyperglycaemia and associated complications. It is the most common form of diabetes and accounts for over 90% of all diabetes cases globally. Its onset is typically gradual and often asymptomatic in the early stages, making early diagnosis and management particularly challenging (4). The complications of T2DM are both microvascular— such as retinopathy, nephropathy, and neuropathy—and macrovascular, which include coronary artery disease, peripheral arterial disease, and cerebrovascular accidents. Due to these complications, individuals with T2DM face a significantly higher risk of cardiovascular morbidity and mortality (5). The interplay between T2DM and cardiovascular diseases is well- documented, with chronic inflammation, dyslipidaemia, endothelial dysfunction, and pro-thrombotic states serving as underlying mechanisms. Consequently, cardiovascular disease remains the leading cause of death among individuals with diabetes (6).

Hypertension, often referred to as high blood pressure, is another critical risk factor that contributes to the development of cardiovascular complications. It is commonly associated with both lifestyle and genetic components, including obesity, high salt intake, excessive alcohol consumption, physical inactivity, and family history (7). Hypertension frequently coexists with diabetes, and the combination of these two conditions markedly increases the risk of adverse cardiovascular events. Elevated blood pressure accelerates the process of atherosclerosis and contributes to left ventricular hypertrophy, heart failure, stroke, and renal impairment. Moreover, hypertension is often asymptomatic until complications arise, earning it the title "silent killer." These

characteristic underscores the importance of routine screening and early intervention to mitigate long-term damage (8).

Cardiovascular diseases, a broad term encompassing conditions such as coronary artery disease, heart failure, myocardial infarction, and stroke, are among the leading causes of mortality worldwide. They represent the culmination of various pathological processes and risk factors, including diabetes and hypertension (9). The global burden of CVDs is profound, accounting for an estimated 17.9 million deaths annually, which constitutes nearly one-third of all global deaths (10). This burden is not evenly distributed; developing nations face a disproportionately higher risk due to limited access to healthcare, lower levels of health literacy, and fewer resources for prevention and management (11). Social determinants of health, including income, education, and access to nutritious food and healthcare services, play a critical role in influencing the risk and outcomes associated with CVDs. Additionally, environmental and occupational exposures, psychosocial stress, and urban living further exacerbate the incidence and severity of these diseases (12).

A descriptive analysis of T2DM, hypertension, and other cardiovascular diseases provides valuable insights into the distribution and patterns of these conditions across different demographic and geographic segments. Such analyses involve examining prevalence rates, incidence trends, and mortality data, along with associated risk factors and comorbidities. They help identify vulnerable populations, evaluate the effectiveness of current prevention and treatment strategies, and guide the allocation of healthcare resources (13). For instance, analysing data by age and gender can reveal age-related disease onset trends or sex-based

differences in disease progression. Similarly, regional analyses may uncover health disparities among urban and rural populations or among different socioeconomic groups. With the rise of big data and electronic health records, there is increasing potential to perform comprehensive and real-time descriptive analyses to inform clinical and public health decision-making (14).

Furthermore, descriptive epidemiology plays a pivotal role in monitoring progress towards global health goals, such as those outlined in the World Health Organization's Global Action Plan for the Prevention and Control of Noncommunicable Diseases (15). By evaluating the trends in T2DM, hypertension, and CVDs, policymakers and researchers can assess the impact of health interventions and identify areas needing improvement. It also aids in raising public awareness and engaging communities in adopting healthier lifestyles. Prevention strategies such as promoting physical activity, reducing salt and sugar intake, encouraging regular health check- ups, and ensuring adherence to medication can be better implemented when the scope and scale of the problem are clearly understood (16).

In conclusion, T2DM, hypertension, and cardiovascular diseases represent interconnected health threats with significant implications for global public health. A comprehensive descriptive analysis of these conditions not only helps elucidate their epidemiological characteristics but also supports the design and implementation of effective prevention and control strategies (17). As these chronic diseases continue to escalate worldwide, particularly in regions undergoing rapid economic and social transitions, an informed and proactive approach rooted in accurate data and contextual understanding becomes ever more critical (18). The objective of this study is to perform a descriptive analysis of Type 2 Diabetes Mellitus, hypertension, and other cardiovascular diseases to identify prevalence patterns, associated risk factors, and demographic trends, thereby guiding targeted interventions, improving disease management, and supporting effective public health policy development (19).

MATERIALS

This descriptive analytical study utilised a structured questionnaire and data collection tool to assess the demographic, clinical, and professional profiles of participants affected by Type 2 Diabetes Mellitus (T2DM), Hypertension, and other cardiovascular diseases (CVDs) (20). A total of 386 participants were recruited based on predefined inclusion and exclusion criteria. The sample population comprised healthcare professionals (n=193), policymakers (n=97), and pharmaceutical industry personnel (n=96), ensuring a diverse representation of stakeholders within the healthcare system. Demographic data collected included age, gender, and professional experience, while clinical information focused on disease types, treatment modalities, and common challenges. The questionnaire was designed to gather comprehensive data on disease- specific treatments, perceived barriers (financial, accessibility, policy awareness, adherence, education), and professional insights into pharmacoeconomics and policy implementation. Ethical approval was obtained, and participants provided informed consent. Data collection tools were validated through pilot testing with a subset of professionals (21). Data were recorded manually and verified digitally to ensure accuracy and consistency. Additionally, graphical representations such as 3D bar charts were prepared to visually illustrate trends across demographic groups and disease categories. This facilitated a multi-dimensional analysis that could better inform the interpretation of the healthcare burden and management challenges associated with chronic non-communicable diseases.

METHODOLOGY

A descriptive, cross-sectional study design was adopted to evaluate the burden and treatment patterns of Type 2 Diabetes Mellitus, Hypertension, and other cardiovascular diseases (CVDs). The study aimed to understand disease prevalence, treatment modalities, and barriers to effective management by collecting data from a purposive sample of 386 respondents. Participants included healthcare professionals, policymakers, and pharmaceutical industry representatives, who were selected based on their relevance and direct involvement in chronic disease care or policy implementation.

The inclusion criteria were adults aged 18 years and above, diagnosed with T2DM, Hypertension, or CVDs, and actively engaged in healthcare service delivery, policy formulation, or pharmaceutical management. Exclusion criteria included individuals under 18 years and those unwilling to participate. Participants were stratified into groups based on profession, age, gender, and years of

experience. The study utilised a structured questionnaire to obtain both quantitative and qualitative data. The questionnaire was divided into sections: demographic profile, professional experience, disease category, treatment regimen, and perceived barriers (22).

Data collection was carried out in both digital and face-to-face formats. Respondents were briefed about the study objectives, and informed consent was obtained. For professionals, information related to clinical insights and health system challenges was recorded to identify systemic gaps. Patients were queried about their access to treatment, costs, adherence, and knowledge of healthcare policies. Responses were cross-verified where possible through clinical records or prescription histories.

Data were entered into Microsoft Excel and subsequently analysed using descriptive statistics, including frequency distribution, percentage analysis, and mean with standard deviation. Graphical visualisations such as 3D bar graphs were generated to depict trends across age groups, treatment types, and years of experience. These visuals helped highlight patterns in disease burden, treatment adherence, and access issues. The methodology also incorporated categorisation of treatment modalities and their usage frequency (e.g., Metformin for diabetes, ACE inhibitors for hypertension), along with analysis of barriers—financial, accessibility- related, educational, and systemic.

This approach allowed for a detailed examination of the multifaceted challenges surrounding chronic disease management in both urban and rural settings. The study also reviewed policy awareness and the extent of utilisation of government schemes for chronic disease treatment. The collected data provided the basis for interpreting patient behaviour, healthcare gaps, and recommendations for improving the current model of care for non-communicable diseases (23). Data integrity was maintained by double-entry verification, and confidentiality of participants was ensured through anonymisation protocols. Ethical clearance was obtained from the relevant institutional review board before the initiation of the study.

RESULTS AND DISCUSSION

A total of 386 individuals participated in this study, categorised into three professional groups: healthcare professionals (50%), policymakers (25%), and pharmaceutical industry personnel (25%). This distribution ensured a balanced representation of perspectives from clinical, regulatory, and industrial domains. Gender analysis revealed a predominance of male participants (59%), while females accounted for 41%. This gender disparity could influence the generalisability of some findings and reflects trends in professional distribution within healthcare systems in certain regions Table 1 and Figure 1 (24).

Table 1. Age-wise distribution of patients, highlighting number, percentage, and common diseases such as early-stage diabetes, hypertension, advanced cardiovascular conditions, and complications across age groups.

Age Group (Years)	Number of Patients	Percentage (%)	Common Diseases
18 - 30	40	10.4%	Early-stage Hypertension, Diabetes
31 - 45	115	29.8%	Diabetes, Mild Hypertension
46 - 60	150	38.9%	Diabetes, Advanced Hypertension, CVDs
Above 60	81	21.0%	Advanced CVDs, Complicated Diabetes

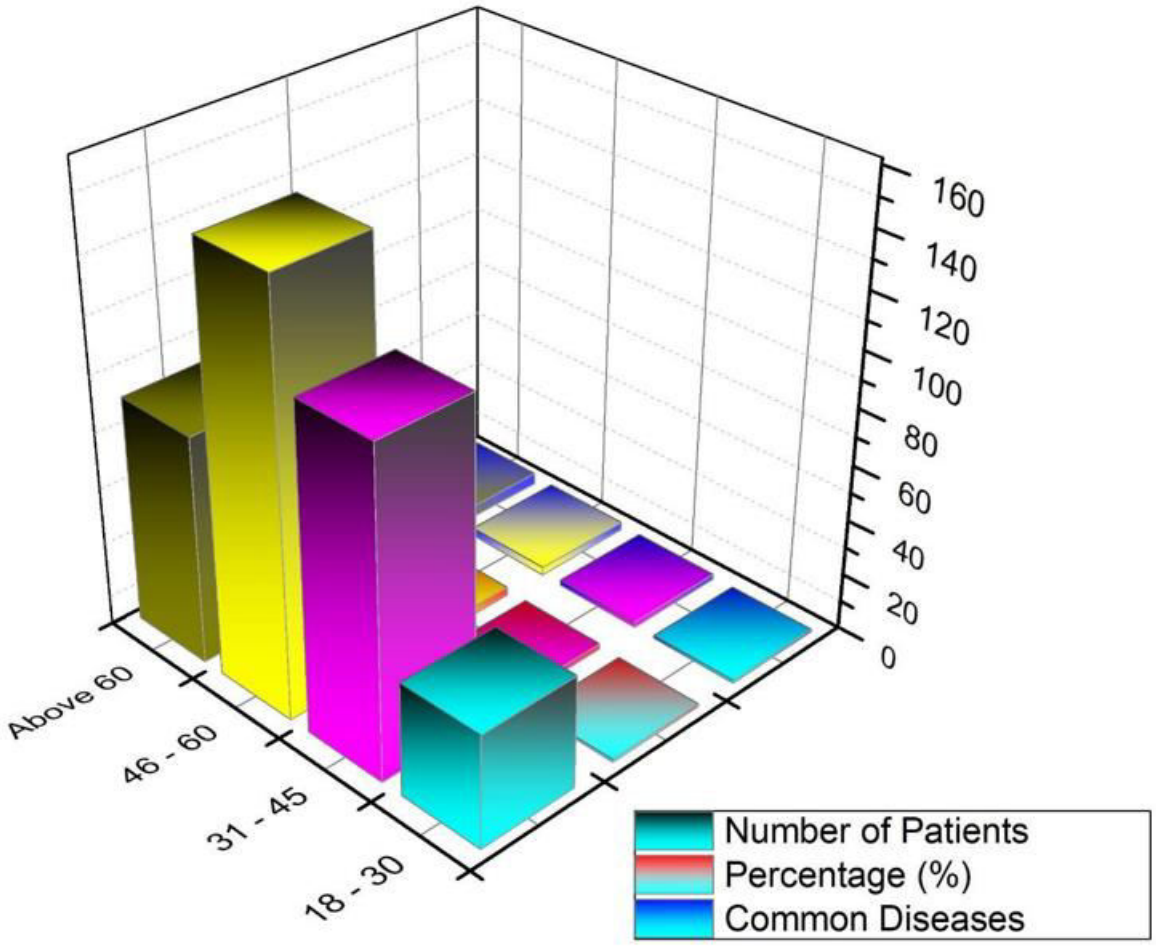

Figure 1. The 3D bar graph shows the distribution of patients across age groups (18-30, 31- 45, 46-60, and above 60), including the number of patients, percentage, and common diseases for each group.

The mean age of the participants was 45.1 years (SD = 17.5), with most individuals falling within the 46–60-year age group (38.9%), followed by the 31–45-year group (29.8%). The older age group (>60 years) accounted for 21%, highlighting the higher burden of chronic conditions in older adults, consistent with global epidemiological data. Participants in the youngest age group (18–30 years) constituted 10.4% and predominantly exhibited early-stage hypertension and diabetes. This emphasises the importance of early intervention and preventive strategies in younger populations Table 2 and Figure 2 (25).

Table 2. Table showing distribution of participants by professional experience, including number, percentage, and primary roles ranging from junior professionals to senior policymakers and healthcare industry leaders.

Experience Group (Years)	Number of Participants	Percentage (%)	Primary Role
0 - 5	58	15.0%	Junior healthcare professionals, entry-level policy staff
6 - 10	92	23.8%	Mid-level clinicians, policy analysts, industry staff
11 - 15	120	31.1%	Senior clinicians, policy strategists, mid-senior industry roles

Above 15	116	30.1%	Senior policymakers, healthcare leaders, senior pharmaceutical managers

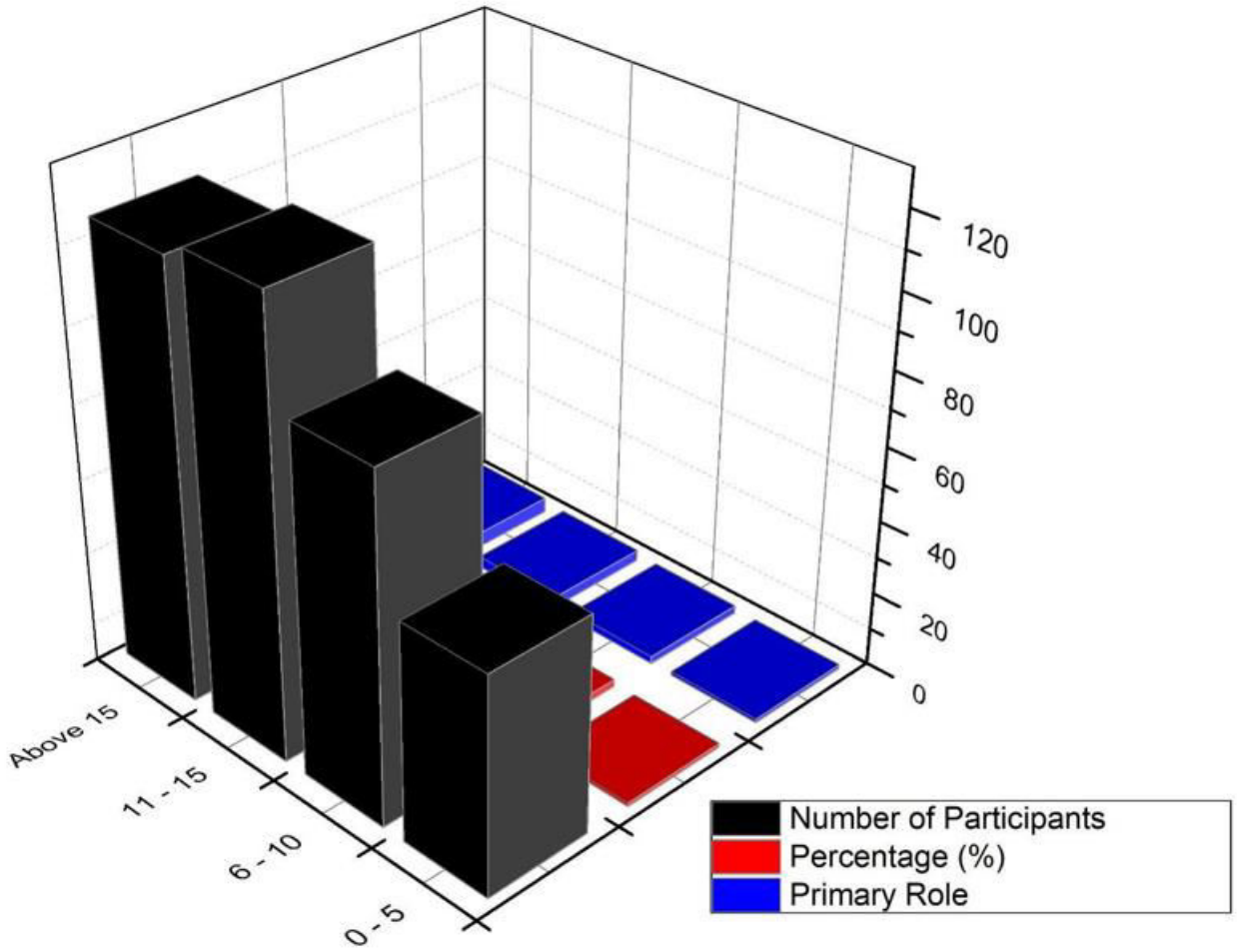

Figure 2. The 3D bar graph displays the distribution of participants based on years of experience: 0-5, 6-10, 11-15, and above 15. It shows the number of participants, their percentage, and primary roles.

Professional experience analysis revealed that the mean duration of work experience was 13 years (SD = 4.7). Participants were segmented into four categories: 0–5 years (15.0%), 6–10 years (23.8%), 11–15 years (31.1%), and above 15 years (30.1%). This stratification helped assess how perceptions and treatment experiences evolved with increasing seniority. Junior staff expressed the need for further training, especially in pharmacoeconomics, while senior participants contributed to healthcare policy discussions and cost-management strategies Table 3 and Figure 3 (26).

Table 3. Table presenting disease-wise distribution of patients, indicating number, percentage, and commonly prescribed treatments for Type 2 Diabetes Mellitus, Hypertension, and other Cardiovascular Diseases (CVDs).

Disease Category	Number of Patients	Percentage (%)	Common Treatments
Disease Category	**Number of Patients**	**Percentage (%)**	**Common Treatments**
Diabetes Mellitus (Type 2)	**178**	**46.1%**	**Metformin, Sulfonylureas, Insulin**

Hypertension	**132**	**34.2%**	**ACE Inhibitors, Beta-Blockers, Calcium Channel Blockers**
Other CVDs (e.g., Coronary Artery Disease, Dyslipidemia)	**76**	**19.7%**	**Statins, Antiplatelet agents, PCSK9 Inhibitors**

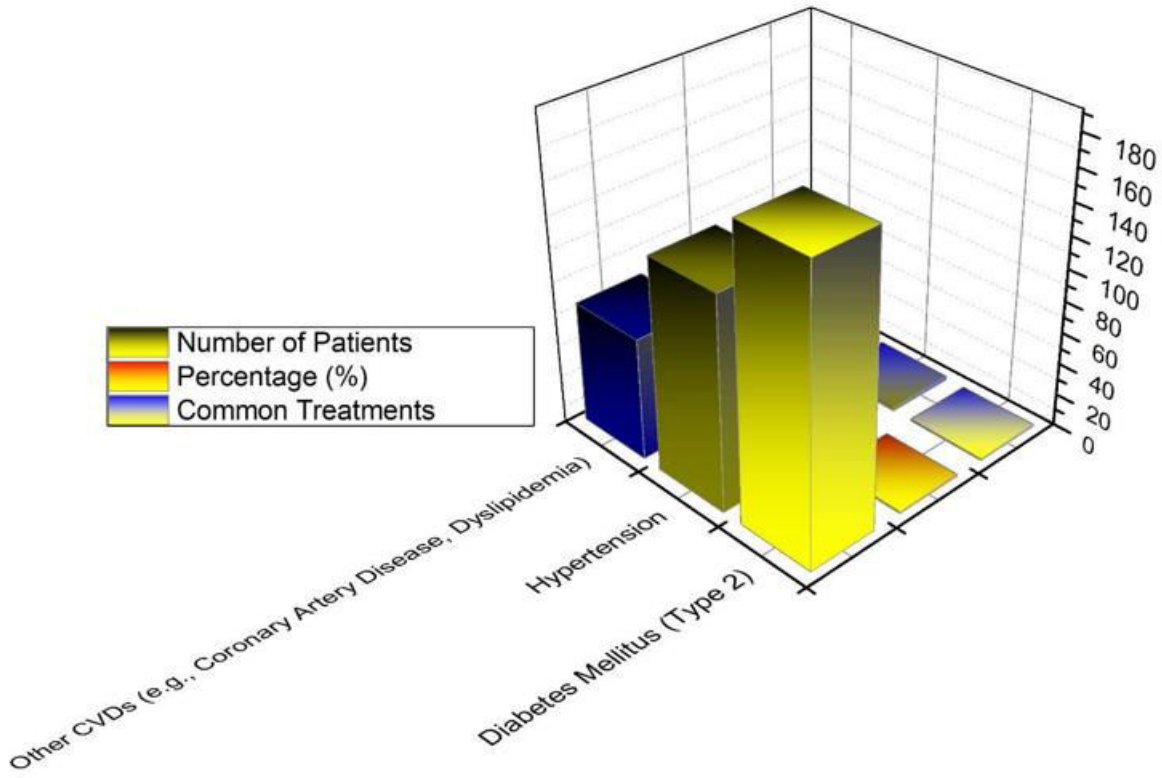

Figure 3. The 3D bar graph illustrates the distribution of patients across Diabetes Mellitus (Type 2), Hypertension, and Other CVDs, showing the number of patients, percentage distribution, and common treatments for each condition.

Disease-wise distribution indicated that Type 2 Diabetes Mellitus was the most prevalent condition, affecting 46.1% of respondents, followed by hypertension (34.2%) and other CVDs (19.7%), such as coronary artery disease and dyslipidaemia. Metformin (81%) and Sulfonylureas (61%) were the most frequently used medications for diabetes, while insulin use was relatively

low (19%) due to its high cost. Treatment for hypertension primarily included ACE inhibitors (64%), beta-blockers (61%), and calcium channel blockers (49%). Statins (71%), aspirin (61%), and PCSK9 inhibitors (14%) were the most common drugs prescribed for CVDs Table 4 and Figure 4 (27).

Table 4. Table summarising primary treatments, usage rates, and key management challenges for Diabetes, Hypertension, and other Cardiovascular Diseases, including financial barriers, adherence issues, and access limitations.

Disease	Primary Treatments	Usage Rate (%)	Challenges Identified
Diabetes	Metformin, Sulfonylureas, Insulin	Metformin (81%), Sulfonylureas (61%), Insulin (19%)	High insulin costs, frequent glucose monitoring expenses

Hypertension	ACE Inhibitors, Beta-Blockers, Calcium Channel Blockers	ACE Inhibitors (64%), Beta-Blockers (61%), CCBs (49%)	Poor medication adherence, limited access to affordable drugs
Other CVDs	Statins, Aspirin (Antiplatelets), PCSK9 Inhibitors	Statins (71%), Aspirin (61%), PCSK9 Inhibitors (14%)	High cost of advanced treatments, limited awareness of preventive care

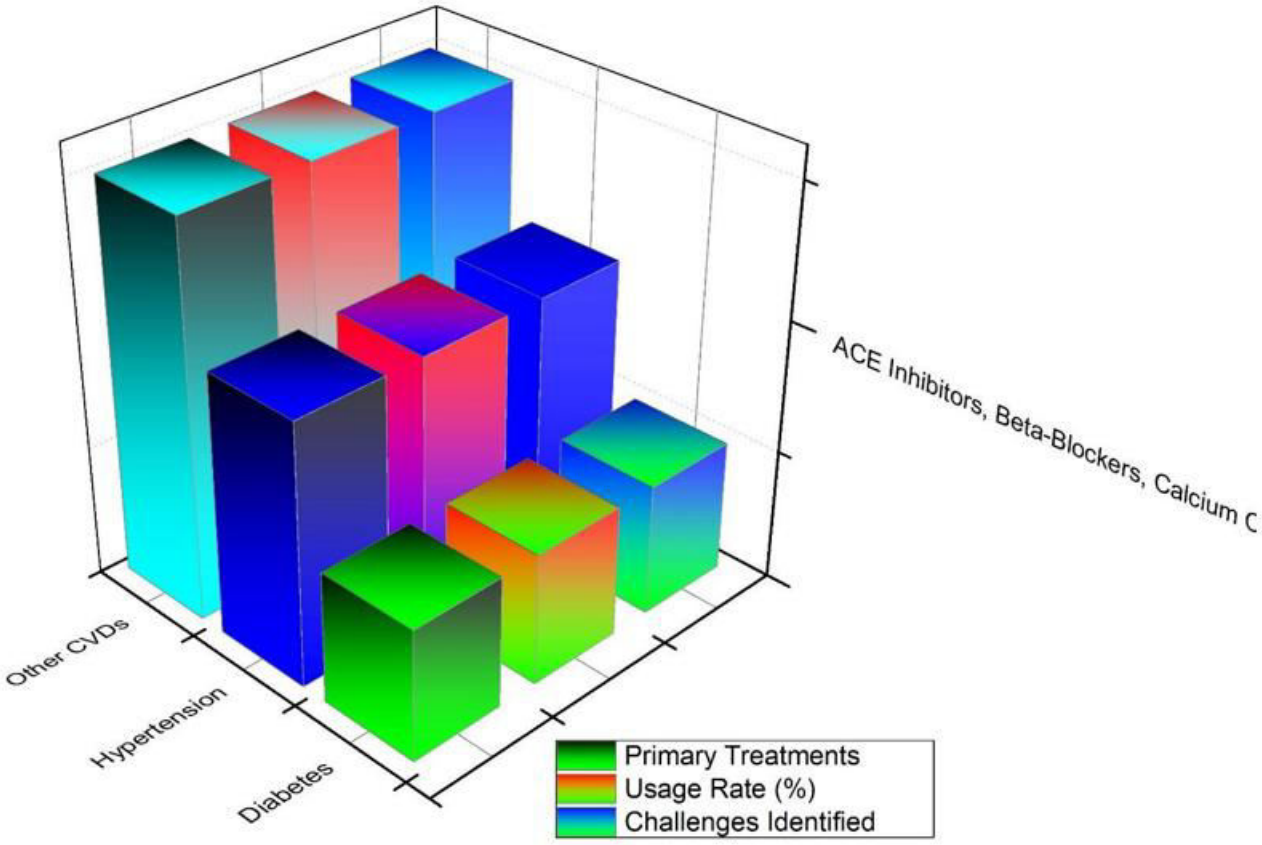

Figure 4. The 3D bar graph compares the primary treatments (ACE Inhibitors, Beta- Blockers, Calcium Channel Blockers) for diabetes, hypertension, and other cardiovascular diseases (CVDs). It highlights the usage rate (%) of each treatment and the challenges identified in managing these conditions, such as access issues, medication adherence, and treatment affordability.

Numerous barriers to treatment emerged from the analysis. Financial barriers were particularly prominent, with high medication costs (especially insulin and PCSK9 inhibitors), expensive diagnostic tests, and limited subsidised treatment options being widely reported. Accessibility issues included the shortage of specialists in rural areas, long travel distances to healthcare facilities, and poorly equipped local health centres. These issues contributed to poor adherence to treatment regimens and follow-ups, particularly among patients with asymptomatic conditions such as hypertension Table 5 and Figure 5 (28).

Table 5. Table detailing disease-specific barriers—financial, access-related, policy awareness, and adherence—for Diabetes, Hypertension, and other Cardiovascular Diseases, highlighting key challenges impacting effective chronic disease management.

Disease	Financial Barriers	Access Barriers	Policy Awareness Barriers	Adherence Barriers

Diabetes	High insulin costs, expensive monitoring devices	Limited rural clinics with diabetes care	Limited knowledge about insulin subsidies	Irregular glucose monitoring, poor medication adherence
Hypertension	Cost of long-term medication	Lack of accessible BP monitoring facilities	Unawareness about free BP screening programs	Poor adherence due to asymptomatic nature of disease
Other CVDs	Expensive cardiac procedures	Limited access to specialized cardiology centers	Lack of awareness about cardiac health subsidies	Missed follow-ups due to high costs

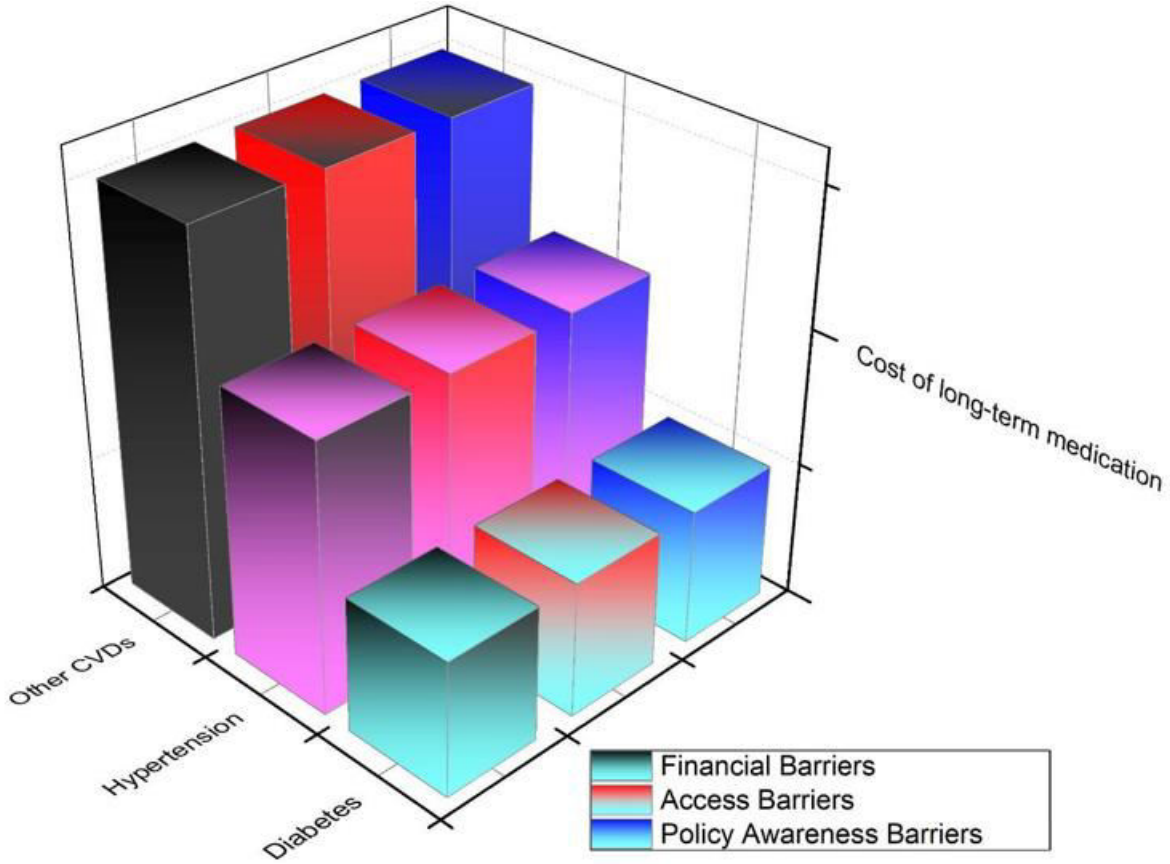

Figure 5. The 3D bar graph illustrates the impact of financial, access, and policy awareness barriers on the cost of long-term medication for diabetes, hypertension, and other cardiovascular diseases (CVDs).

Policy awareness was another major concern. Many participants were unaware of government health schemes and subsidies, especially those in rural areas. Even when aware, the complexity of enrolment procedures discouraged participation. This disconnects limited access to affordable care and contributed to treatment discontinuation. Educational barriers also played a significant role. Many patients lacked basic health literacy, had misconceptions about medication usage, and were unaware of the importance of preventive care and regular follow-ups. Inadequate patient counselling compounded these challenges, resulting in ineffective disease management.

Systemic challenges such as bureaucratic delays in policy implementation, inefficiencies in public healthcare delivery, and frequent medication stock-outs further complicated chronic disease care. These systemic gaps affected patient compliance, increased out-of-pocket expenditures, and reduced the overall effectiveness of treatment strategies (29).

In summary, the findings underline a complex interplay of socio-economic, infrastructural, and systemic barriers in the management of T2DM, hypertension, and CVDs. Addressing these multifactorial challenges requires coordinated policy interventions, investment in healthcare infrastructure, and enhanced patient education and counselling services. Equitable access to medication and timely healthcare services must be prioritised to improve patient outcomes and reduce the growing burden of chronic diseases (30).

CONCLUSION

This descriptive analysis highlights the multifaceted challenges involved in the management of Type 2 Diabetes Mellitus, Hypertension, and other cardiovascular diseases. With a diverse participant group of healthcare professionals, policymakers, and industry representatives, the study provides comprehensive insights into treatment practices, demographic patterns, and barriers to care. The findings revealed a high prevalence of T2DM and hypertension, particularly among individuals aged 46–60 years, reflecting the growing burden of chronic diseases in middle-aged and older populations.

The study identified several critical barriers, including high medication and diagnostic costs, limited access to specialised care in rural areas, and poor awareness of government health schemes. Educational deficits and misconceptions about treatment further compounded the issue, leading to poor adherence and inconsistent disease management. Systemic limitations such as

bureaucratic delays, overburdened healthcare facilities, and stock-outs of essential medicines also adversely affected patient care. To address these challenges, a multi-level strategy involving policy reform, infrastructure development, and patient-centric education is essential. Strengthening supply chains, enhancing health literacy, and simplifying policy access could significantly improve outcomes. Overall, this analysis emphasises the need for an integrated approach to combat the increasing burden of chronic diseases and foster sustainable healthcare delivery models.

REFERENCES

1. Ahmad R, Akter F, Haque M. Diet and nutrition for non-communicable diseases in low and middle-income countries. Frontiers in Nutrition. 2023 Mar 28;10:1179640.
2. Al-Osimi MG, Al-Muqati FM, Alotaibi WA, Alotaibi BS, Alotaibi SM, Alosaimi JF, Alghannami AM, Al-Osaimi SE, Alkuwaiz MA, Alotaibi MB. Chronic Diseases and Their Impact on Public Health. Journal of International Crisis and Risk Communication Research. 2024;7(S8):742.
3. Choi M, Sempungu JK, Lee EH, Lee YH. Living longer but in poor health: healthcare system responses to ageing populations in industrialised countries based on the Findings from the Global Burden of Disease Study 2019. BMC Public Health. 2024 Feb 22;24(1):576.
4. Hossain MJ, Al-Mamun M, Islam MR. Diabetes mellitus, the fastest growing global public health concern: Early detection should be focused. Health Science Reports. 2024 Mar;7(3):e2004.
5. Yen FS, Wei JC, Shih YH, Hsu CC, Hwu CM. Impact of individual microvascular disease on the risks of macrovascular complications in type 2 diabetes: a nationwide population-based cohort study. Cardiovascular diabetology. 2023 May 9;22(1):109.
6. Greaves J, Pula G. Hyperactivity and Pro-inflammatory Functions of Platelets in Diabetes. Frontiers in Bioscience-Landmark. 2025 Jan 8;30(1):26190.
7. Ghosh S, Dhar S, Bhattacharjee S, Bhattacharjee P. Contribution of environmental, genetic and epigenetic factors to obesity-related metabolic syndrome. The Nucleus. 2023 Aug;66(2):215-37.
8. World Health Organization. Global report on hypertension: the race against a silent killer. World Health Organization; 2023 Sep 19.
9. Sulashvili N, Nimangre RR. Manifestation of some aspects of cardiovascular diseases, implications, pharmacotherapeutic strategies, effects, impacts and potential hazards in general. Junior Researchers. 2025 Feb 7;3(1):1-27.
10. Alanzi SS, Almayouf SM, Alotaibi KM, Alanazi AO, Ghuwayzi H, Alharbi ON, Aldajani OH. Global Burden, Risk Factors, and Evidence-Based Strategies for Cardiovascular Disease Prevention: A Comprehensive Systematic Review. Journal of Angiotherapy. 2025 Jan 16;9(1):1-20.
11. Estrela M, Semedo G, Roque F, Ferreira PL, Herdeiro MT. Sociodemographic determinants of digital health literacy: a systematic review and meta-analysis. International Journal of Medical Informatics. 2023 Sep 1;177:105124.
12. Padda I, Fabian D, Farid M, Mahtani A, Sethi Y, Ralhan T, Das M, Chandi S, Johal G. Social determinants of health and its impact on cardiovascular disease in underserved populations: A critical review. Current Problems in Cardiology. 2024 Mar 1;49(3):102373.
13. Bentué-Martínez C, Mimbrero MR, Zúñiga-Antón M. Spatial patterns in sociodemographic factors explain to a large extent the prevalence of hypertension and diabetes in Aragon (Spain). Frontiers in Medicine. 2023 Jan 25;10:1016157.
14. Latif F, Nasir MM, Rehman WU, Hamza M, Mattumpuram J, Meer KK, Silvet H, Yarkoni A, Sabouni MA, Braiteh N, Patel K. Demographics and regional trends of ischemic heart disease-related mortality in older adults in the United States, 1999–2020. PLoS One. 2025 Jan 24;20(1):e0318073.
15. Schwartz LN, Shaffer JD, Bukhman G. The origins of the 4× 4 framework for noncommunicable disease at the World Health Organization. SSM-Population Health. 2021 Mar 1;13:100731.
16. Ogundeko-Olugbami O, Ogundeko O, Lawan M, Foster E. Harnessing data for impact: Transforming public health interventions through evidence-based decision-making. World Journal of Advanced Research and Reviews. 2025

Jan;25(1):2085-103.
17. Siam NH, Snigdha NN, Tabasumma N, Parvin I. Diabetes Mellitus and Cardiovascular Disease: exploring epidemiology, pathophysiology, and treatment strategies. Reviews in Cardiovascular Medicine. 2024 Dec 11;25(12):436.
18. Chakilam C. Integrating Machine Learning and Big Data Analytics to Transform Patient Outcomes in Chronic Disease Management. Journal of Survey in Fisheries Sciences. 2022;9(3):118-30.
19. Bai Z, Han J, An J, Wang H, Du X, Yang Z, Mo X. The global, regional, and national patterns of change in the burden of congenital birth defects, 1990–2021: an analysis of the global burden of disease study 2021 and forecast to 2040. EClinicalMedicine. 2024 Nov 1;77.
20. Dey S, Mukherjee A, Pati MK, Kar A, Ramanaik S, Pujar A, Malve V, Mohan HL, Jayanna K, N S. Socio-demographic, behavioural and clinical factors influencing control of diabetes and hypertension in urban Mysore, South India: a mixed-method study conducted in 2018. Archives of Public Health. 2022 Nov 15;80(1):234.
21. Basil B, Mohammed J, Mba IN. Hypertension in Type 2 Diabetes Mellitus: Prevalence, Patterns, Determinants and Implications for cardiovascular risk prediction in Nigerian patients.
22. Moghimi E, Stephenson C, Gutierrez G, Jagayat J, Layzell G, Patel C, McCart A, Gibney C, Langstaff C, Ayonrinde O, Khalid-Khan S. Mental health challenges, treatment experiences, and care needs of post-secondary students: a cross-sectional mixed-methods study. BMC public health. 2023 Apr 6;23(1):655.
23. Mbata AO, Soyege OS, Nwokedi CN, Tomoh BO, Mustapha AY, Balogun OD, Forkuo AY, Iguma DR. Preventative medicine and chronic disease management: reducing healthcare costs and improving long-term public health. International Journal of Multidisciplinary Research and Growth Evaluation. 2024 Nov;5(06):1584-600.
24. Perera ND, Bellomo TR, Schmidt WM, Litt HK, Shyu M, Stavins MA, Wang MM, Bell A, Saleki M, Wolf KI, Ionescu R. Analysis of female participant representation in registered oncology clinical trials in the United States from 2008 to 2020. The oncologist. 2023 Jun 1;28(6):510-9.
25. GBD 2019 Ageing Collaborators. Global, regional, and national burden of diseases and injuries for adults 70 years and older: systematic analysis for the Global Burden of Disease 2019 Study. bmj. 2022 Mar 10;376.
26. Alzarea AI, Khan YH, Alanazi AS, Butt MH, Almalki ZS, AlAhmari AK, Alsahali S, Mallhi TH. Barriers and facilitators of pharmacoeconomic studies: a review of evidence from the middle eastern countries. International journal of environmental research and public health. 2022 Jun 27;19(13):7862.
27. Yen FS, Wei JC, Chiu LT, Hsu CC, Hwu CM. Diabetes, hypertension, and cardiovascular disease development. Journal of translational medicine. 2022 Jan 3;20(1):9.
28. Castillo-Laborde, Carla & Hirmas, Macarena & Matute, Isabel & Jasmen, Anita & Urrejola, Oscar & Molina, Xaviera & Awad, Camila & Frey-Moreno, Catalina & Pumarino-Lira, Sofia & Descalzi-Rojas, Fernando & Ruiz, Tomás & Plass, Barbara. (2022). Barriers and Facilitators in Access to Diabetes, Hypertension, and Dyslipidemia Medicines: A Scoping Review. Public Health Reviews. 43. 1604796. 10.3389/phrs.2022.1604796.
29. Wang J, Tan F, Wang Z, Yu Y, Yang J, Wang Y, Shao R, Yin X. Understanding gaps in the hypertension and diabetes care cascade: systematic scoping review. JMIR Public Health and Surveillance. 2024 Feb 16;10:e51802.
30. Mbata AO, Soyege OS, Nwokedi CN, Tomoh BO, Mustapha AY, Balogun OD, Forkuo AY, Iguma DR. Preventative medicine and chronic disease management: reducing healthcare costs and improving long-term public health. International Journal of Multidisciplinary Research and Growth Evaluation. 2024 Nov;5(06):1584-600.