



Original Research Article

Role of Clinical Pharmacists in the Management of Diabetes Mellitus in Tertiary Care Hospitals: A Review

Article History:

Name of Author:

C. Sundara Moorthi¹, *M. Kavitha², S. Rithiya³, U. Nithyakumari⁴, M. Jegathis Kumar⁵, S. Yogakrishnan⁵, N. Anbazhagan⁶, S. Shivapranav⁷, S. Yoga⁸ and K. E. Geethu⁹

Affiliation: ¹Professor, Dept of Pharmaceutics, KMCH College of Pharmacy, Coimbatore, Tamil Nadu

²Associate Professor of English Dr. N.G.P. Arts and Science College, Kalapatti, Coimbatore

³Assistant Professor of English Dr. N.G.P Arts and Science College, Kalapatti, Coimbatore

⁴Assistant professor Bishop Appasamy College of Arts and Science, Coimbatore-18

⁵Assistant Professor, KMCH College of Pharmacy, Coimbatore

⁶Assistant Professor, Dept of computer Science, KMCH college of Pharmacy, Coimbatore.

⁷Dept of Pharmacy, Manipal College of Pharmaceutical Sciences, Manipal, Karnataka.

⁸Research Scholar Dr. N.G.P Arts and Science College, Kalapatti, Coimbatore

⁹Dr.N.G. P Arts and Science College, K/alapatti, Coimbatore

Corresponding Author:

*M. Kavitha

Received: 10-10-2025

Revised: 28-10-2025

Accepted: 18-11-2025

Published: 30-12-2025

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Noncommercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Abstract: Diabetes mellitus is a chronic metabolic disorder characterised by persistent hyperglycemia and associated complications affecting multiple organ systems. Effective management requires a multidisciplinary approach involving physicians, nurses, dietitians, and clinical pharmacists. In tertiary care hospitals, clinical pharmacists play a crucial role in optimising pharmacotherapy, improving medication adherence, preventing complications, and enhancing patient outcomes. This review highlights the role of clinical pharmacists in diabetes management, their interventions, impact on patient care, and challenges faced in hospital settings.

Keywords: Diabetes mellitus, Clinical pharmacy, Tertiary care hospitals, Medication therapy management, Patient counselling, pharmaceutical care.

INTRODUCTION

Diabetes mellitus is a major public health concern worldwide, with a continuously increasing prevalence and a significant economic and social burden on healthcare systems. According to the World Health

Organisation, diabetes is among the leading causes of morbidity and mortality, contributing substantially to complications such as cardiovascular diseases, renal failure, blindness, and lower-limb amputations. The long-term nature of the disease requires lifelong

treatment, regular monitoring, and continuous lifestyle modification, which further increases healthcare costs and resource utilisation.

Similarly, the International Diabetes Federation reports a rapid rise in diabetes cases, particularly in developing and low- and middle-income countries, where access to quality healthcare services may be limited. Factors such as urbanisation, sedentary lifestyles, unhealthy dietary habits, obesity, and population ageing have significantly contributed to this growing burden. In many regions, delayed diagnosis and poor treatment adherence further worsen disease outcomes.

Tertiary care hospitals play a crucial role in managing complex and critically ill diabetic patients who often present with multiple comorbidities, severe complications, and treatment-resistant conditions. These patients require intensive monitoring, individualised therapy, and multidisciplinary care. In such settings, clinical pharmacists contribute significantly to patient-centred care by optimising pharmacotherapy, preventing medication-related problems, improving adherence, and promoting rational drug use. Their involvement ensures the safe, effective, and evidence-based use of antidiabetic medications, ultimately leading to improved glycemic control, reduced complications, and enhanced quality of life for patients.

OVERVIEW OF DIABETES MELLITUS

Diabetes mellitus is characterised by impaired insulin secretion, insulin action, or both, resulting in chronic hyperglycemia. It is broadly classified into:

- **Type 1 Diabetes Mellitus (T1DM)** – Insulin-dependent diabetes due to autoimmune destruction of β -cells
- **Type 2 Diabetes Mellitus (T2DM)** – Insulin resistance with relative insulin deficiency
- **Gestational Diabetes Mellitus (GDM)** – Diabetes during pregnancy
- **Secondary Diabetes** – Due to drugs, endocrine disorders, or pancreatic diseases

Poorly controlled diabetes leads to complications such as nephropathy, neuropathy, retinopathy, cardiovascular diseases, and infections.

ROLE OF CLINICAL PHARMACISTS IN TERTIARY CARE HOSPITALS

Clinical pharmacists are trained healthcare professionals who specialise in medication management and therapeutic decision-making. In diabetes care, their role includes the following:

Medication Therapy Management (MTM)

- Reviewing prescriptions for accuracy and appropriateness

- Selecting suitable antidiabetic agents based on patient profile
- Monitoring drug interactions and contraindications
- Adjusting doses in renal or hepatic impairment

Pharmacists ensure that treatment follows evidence-based guidelines such as those issued by the **American Diabetes Association**.

Patient Counselling and Education

Patient education is essential for long-term diabetes control. Clinical pharmacists provide counselling on:

- Proper use of insulin and oral hypoglycemic agents
- Blood glucose monitoring techniques
- Lifestyle modification (diet and exercise)
- Recognition and management of hypoglycemia
- Importance of medication adherence

Such interventions improve self-management skills and reduce hospital readmissions.

Monitoring and Prevention of Adverse Drug Reactions

Antidiabetic drugs may cause adverse effects such as hypoglycemia, weight gain, gastrointestinal disturbances, and lactic acidosis. Pharmacists:

- Monitor patients for adverse drug reactions (ADRs)
- Report ADRs through pharmacovigilance systems
- Suggest alternative therapies when necessary
- Prevent medication errors in insulin administration

Therapeutic Drug Monitoring and Glycemic Control

Clinical pharmacists assist in:

- Interpreting blood glucose and HbA1c levels
- Modifying therapy based on laboratory results
- Ensuring optimal insulin titration
- Managing intravenous insulin in critical care units

This helps achieve target glycemic levels and prevent complications.

Interprofessional Collaboration

In tertiary hospitals, pharmacists collaborate with:

- Physicians for therapy optimisation
- Nurses for safe medication administration
- Dietitians for nutritional planning
- Laboratory staff for monitoring parameters

This team-based approach improves clinical outcomes and patient satisfaction.

IMPACT OF CLINICAL PHARMACIST INTERVENTIONS

Several studies have demonstrated the positive impact of clinical pharmacists in diabetes management:

- Improved glycemic control (reduced HbA1c levels)
- Enhanced medication adherence
- Reduction in drug-related problems
- Decreased hospitalisation and healthcare costs
- Improved quality of life

Pharmacist-led clinics and ward rounds have shown significant benefits in managing chronic diabetic patients.

ROLE IN SPECIAL CLINICAL SITUATIONS

Diabetes in Critically Ill Patients

In intensive care units, pharmacists assist in:

- Managing insulin infusion protocols
- Preventing hypoglycemia
- Adjusting therapy during infections or surgery

Diabetes with Comorbidities

Patients with hypertension, renal failure, or cardiovascular diseases require careful drug selection. Pharmacists ensure:

- Safe polypharmacy management
- Dose adjustments
- Avoidance of nephrotoxic or cardiotoxic drugs

Geriatric and Pediatric Patients

Special attention is required for elderly and pediatric patients due to altered pharmacokinetics. Pharmacists help in individualising therapy for these populations.

CHALLENGES IN CLINICAL PHARMACY PRACTICE

Despite their important role, clinical pharmacists face several challenges:

- Limited workforce in hospitals
- Lack of recognition in some healthcare systems
- Time constraints
- Inadequate training opportunities
- Resistance to interdisciplinary collaboration

Overcoming these barriers is essential for expanding pharmaceutical care services.

FUTURE PERSPECTIVES

The future of clinical pharmacy in diabetes management includes:

- Establishment of pharmacist-led diabetes clinics
- Use of digital health tools for monitoring
- Telepharmacy services
- Continuous professional development programs
- Policy support for clinical pharmacy services

These advancements will further strengthen pharmacists' contributions to patient care.

CONCLUSION

Clinical pharmacists play a vital role in the management of diabetes mellitus in tertiary care hospitals. Through medication therapy management, patient education, monitoring of adverse effects, and collaboration with healthcare professionals, they significantly improve treatment outcomes. Strengthening clinical pharmacy services and integrating pharmacists into healthcare teams can enhance the quality of diabetes care and reduce disease-related complications.

REFERENCES

1. World Health Organisation. (2016). *Global report on diabetes*. WHO Press.
2. International Diabetes Federation. (2021). *IDF diabetes atlas* (10th ed.). IDF.
3. American Diabetes Association. (2024). Standards of medical care in diabetes—2024. *Diabetes Care*, 47(Supplement 1), S1–S350. <https://doi.org/10.2337/dc24-Sint>
4. Pousinho, S., Morgado, M., Plácido, A. I., Roque, F., Falcão, A., & Alves, G. (2020). Clinical pharmacists' interventions in the management of type 2 diabetes mellitus: A systematic review. *Pharmacy Practice*, 18(3), 2000. <https://doi.org/10.18549/PharmPract.2020.3.2000>
5. Iqbal, M. Z., Khan, A. H., Iqbal, M. S., Syed Sulaiman, S. A., & Khan, A. H. (2019). A review of pharmacist-led interventions on diabetes outcomes. *Journal of Pharmacy and Bioallied Sciences*, 11(2), 123–129. https://doi.org/10.4103/jpbs.JPBS_16_19
6. Shareef, J., Fernandes, J., & Samaga, L. (2016). Assessment of clinical pharmacist interventions in drug therapy in patients with diabetes mellitus in a tertiary care teaching hospital. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 10(2), 82–87. <https://doi.org/10.1016/j.dsx.2015.12.031>
7. Alhabib, S., Aldraimly, M., & Alfarhan, A. (2016). An evolving role of clinical pharmacists in managing diabetes: Evidence from the literature. *Saudi Pharmaceutical Journal*, 24(4), 441–446. <https://doi.org/10.1016/j.jsps.2015.02.007>
8. Hepler, C. D., & Strand, L. M. (1990). Opportunities and responsibilities in

pharmaceutical care. *American Journal of Hospital Pharmacy*, 47(3), 533–543.

9. Cipolle, R. J., Strand, L. M., & Morley, P. C. (2012). *Pharmaceutical care practice: The patient-centered approach to medication management services* (3rd ed.). McGraw-Hill.
10. Wubben, D. P., & Vivian, E. M. (2008). Effects of pharmacist outpatient interventions on adults with diabetes mellitus. *Diabetes Care*, 31(2), 270–275. <https://doi.org/10.2337/dc07-1349>