International Journal of Pharmacy and Pharmaceutical Research (IJPPR)
Volume 32, Issue 2, February 2026 **ijppr.humanjournals.com** ISSN: 2349-7203

The Role of Pharmacists in Adult Immunization among Patients with Diabetes Mellitus

***Abhinav Kumar Dokania**

M.pharm, Community pharmacist. Medicine 4U, Ranchi, Jharkhand. India.
Guest lecturer at Meera Institute of Technology and Pharmacy, Ranchi, Jharkhand. India.

Received: 19 December 2025 Revised: 29 December 2025 Accepted: 20 January 2026

ABSTRACT

Diabetes mellitus is a chronic metabolic disorder associated with substantial global morbidity and mortality. In addition to well-established microvascular and macrovascular complications, diabetes confers an increased susceptibility to infectious diseases. Persistent hyperglycaemia, immune dysfunction, and the presence of multiple comorbidities impair host defence mechanisms, leading to higher infection rates, greater disease severity, and poorer clinical outcomes. Vaccine-preventable infections such as influenza, pneumococcal disease, hepatitis B, and COVID-19 contribute significantly to infection-related hospitalisations and mortality in individuals with diabetes. Immunisation represents a safe, effective, and cost-efficient preventive strategy and should be integrated into routine diabetes management. Despite clear recommendations from international health authorities, adult vaccination coverage among people with diabetes remains suboptimal, particularly in low- and middle-income countries. Limited awareness, vaccine hesitancy, safety concerns, inconsistent healthcare provider recommendations, and restricted access to immunisation services are major contributors to poor uptake. Pharmacists, owing to their accessibility and frequent patient contact, are uniquely positioned to address these barriers. Their expanding role includes patient education, identification of high-risk individuals, promotion and administration of vaccines, and coordination of immunisation services within diabetes care.

Keywords: Diabetes mellitus, Adult immunization, Vaccine-preventable infections, Pharmacists, Immunisation services, Infectious diseases, Public health, Chronic disease management

INTRODUCTION

Diabetes mellitus (DM) represents a major global health burden, with prevalence continuing to rise worldwide, particularly in developing countries such as India [1]. While the metabolic and vascular complications of diabetes are well documented, its association with increased susceptibility to infectious diseases is often underrecognized. Infections are a leading cause of hospitalisation and mortality among individuals with diabetes, frequently complicating disease management, and prognosis [2].

Chronic hyperglycaemia impairs innate and adaptive immune responses by reducing neutrophil function, impairing phagocytosis, and altering cytokine production, thereby increasing vulnerability to infections [3]. Many of these infections are preventable through appropriate vaccination strategies.

Infectious Diseases Associated with Diabetes Mellitus

Individuals with diabetes experience higher rates of infections and worse clinical outcomes compared with non-diabetic populations [4]. Respiratory tract infections, viral hepatitis, urinary tract infections, and skin and soft-tissue infections are particularly prevalent. In patients with type 2 diabetes mellitus, peripheral neuropathy and vascular disease further increase infection risk by impairing circulation and delaying wound healing [5]. Skin breakdown in patients with uncontrolled diabetes and peripheral vascular disease provides entry for bacteria [5,6].

Poor glycaemic control has been independently associated with increased risk of community-acquired pneumonia and infection-related hospitalisation [6]. Additionally, the relationship between diabetes and infection is bidirectional, as certain viral infections may worsen insulin resistance or contribute to the development of diabetes in genetically susceptible individuals [10].

Infections of Clinical Importance

Several factors have been implicated for infections in diabetes of which altered immunity is most important. Other predisposing factors increase susceptibility to infections like frequent catheterization and dialysis in chronic renal failure patient [10,11].

Urinary tract infection, respiratory tract infection, foot, and deep soft infections are common in T2DM [11].

Infections that commonly occur in patients with diabetes

Influenza

Individuals with diabetes are at increased risk of severe influenza-related complications, including hospitalisation and cardiovascular events. Influenza infection may also destabilise glycaemic control and precipitate acute metabolic complications [11].

Skin and Soft-Tissue Infections

Diabetic foot infections and soft-tissue infections of the extremities are common causes of morbidity and may progress rapidly without early intervention. Preventive strategies, including patient education on foot care and hygiene, are essential to reduce complications [12].

Viral Hepatitis

Diabetes is closely associated with chronic viral hepatitis, particularly hepatitis C, which is linked to insulin resistance and an increased prevalence of type 2 diabetes [13]. Conversely, frequent healthcare exposure and impaired immunity increase susceptibility to hepatitis infections among individuals with diabetes. Hepatitis B vaccination and routine screening are therefore critical preventive measures [14].

Types of vaccination in Diabetes Mellitus

Individuals with diabetes should receive age-appropriate and condition-specific vaccinations. Annual influenza vaccination reduces influenza-related complications and hospitalisation. [11] To all unvaccinated patients with the diabetes of 19-59 years, three dose series of HBV is recommended. [14].

Pneumococcal vaccination protects against invasive pneumococcal disease and pneumonia, which are associated with increased morbidity and mortality in diabetic patients. Two Pneumococcal vaccines are available: PPSV23 and PCV 13. The panel recommends the use of PCV 13 for adults >50 years followed by a dose of PPSV23 at least one year later depending on the clinical judgment of the physician. [15].

Hepatitis B vaccination (HBV) is recommended due to the increased risk of virus transmission during blood glucose monitoring and other medical procedures [14]. COVID-19 vaccination significantly reduces the risk of severe disease, intensive care admission, and mortality among people with diabetes [16]. Additional vaccines, including Td/Tdap and herpes zoster vaccines, should be administered according to adult immunisation schedules [17].

Apart from the vaccines mentioned above other routinely recommended, age related vaccines should also be provided to all diabetes patients. [14,17]

Barriers to Vaccine Uptake

Despite strong evidence supporting vaccination, immunisation coverage among adults with diabetes remains inadequate. Major barriers include limited patient awareness, vaccine hesitancy, inadequate access to immunisation services, and insufficient emphasis on adult vaccination by healthcare professionals [7,18].

Role of Pharmacists in Adult Immunisation

Pharmacists as educators

Pharmacists, when appropriately trained, play a critical role in patient engagement by addressing misconceptions surrounding vaccines, reducing vaccine hesitancy, and offering structured immunisation reminders and recommendations. Community-based

educational initiatives, including awareness programmes and the use of informational cue cards during pharmacy encounters, further support public understanding of the importance of vaccination. Regular patient interactions during medication dispensing create opportunities for effective counselling, which can enhance vaccine acceptance, improve adherence to recommended immunisation schedules, and enable appropriate patient follow-up [21]. Empirical evidence from community pharmacies in the Isle of Wight, England, demonstrated the effectiveness of pharmacist-led interventions, with pharmacies accounting for 9.7% of all influenza vaccinations administered during the 2010–2011 influenza season. Additionally, pharmacy staff reminders were identified as the primary catalyst for approximately two-thirds of these vaccinations, underscoring the significant contribution of pharmacists to improving vaccine coverage [23].

Vaccine Administration

In many countries, regulatory frameworks have progressively expanded the scope of pharmacy practice to authorise pharmacists to administer vaccines, recognising their accessibility and integral role within the healthcare system. Pharmacist-led immunisation services offered in community pharmacy settings enhance convenience for patients by providing flexible hours, walk-in availability, and proximity to residential areas. Evidence indicates that the inclusion of pharmacies as immunisation sites contributes to improved vaccination coverage, particularly among adults who may have limited contact with traditional healthcare providers. Furthermore, pharmacy-based vaccination programmes help to alleviate pressure on hospitals and primary care clinics by redistributing immunisation services, thereby allowing other healthcare professionals to focus on more complex clinical responsibilities. Collectively, these advantages underscore the contribution of pharmacist-delivered vaccination services to strengthening immunisation delivery and public health outcomes [20].

Risk Identification and Follow-Up

Pharmacists can identify high-risk individuals through medication reviews, recommend appropriate vaccines, ensure completion of immunisation schedules, and monitor post-vaccination outcomes [21].

Public Health Integration

Pharmacists contribute to community and hospital-based immunisation programmes and national vaccination campaigns. Expanding pharmacist-led immunisation services, particularly in India, may significantly strengthen adult vaccination efforts and reduce preventable infections [22].

Conclusion

Diabetes mellitus increases susceptibility to infectious diseases through immune dysfunction, comorbid conditions, and frequent healthcare exposure. Vaccine-preventable infections remain a major contributor to adverse health outcomes in this population. Integrating immunisation into routine diabetes care is therefore essential.

Pharmacists, as accessible and trusted healthcare professionals, play a vital role in improving adult immunisation through education, advocacy, vaccine administration, and interprofessional collaboration. Policy support, structured training, and regulatory recognition are crucial to optimise pharmacist-led immunisation services and improve health outcomes in individuals with diabetes.

REFERENCES

1. International Diabetes Federation. **IDF Diabetes Atlas**. 10th ed. Brussels: International Diabetes Federation; 2021.
2. Shah BR, Hux JE. Quantifying the risk of infectious diseases for people with diabetes. **Diabetes Care**. 2003;26(2):510–3.
3. Geerlings SE, Hoepelman AI. Immune dysfunction in patients with diabetes mellitus. **FEMS Immunol Med Microbiol**. 1999;26(3–4):259–65.
4. Casqueiro J, Casqueiro J, Alves C. Infections in patients with diabetes mellitus: a review of pathogenesis. **Indian J Endocrinol Metab**. 2012;16(Suppl 1):S27–36.
5. Muller LM, Gorter KJ, Hak E, et al. Increased risk of common infections in patients with type 1 and type 2 diabetes mellitus. **Clin Infect Dis**. 2005;41(3):281–8.
6. Kornum JB, Thomsen RW, Riis A, et al. Diabetes, glycemic control, and risk of hospitalization with pneumonia. **Diabetes Care**. 2008;31(8):1541–5.
7. World Health Organization. **Global Vaccine Action Plan 2011–2020**. Geneva: World Health Organization; 2013.
8. Isenor JE, Edwards NT, Alia TA, et al. Impact of pharmacists as immunizers on vaccination rates. **Hum Vaccin Immunother**. 2016;12(6):1563–75.

9. Papastergiou J, Folkins C, Li W, Zervas J. Community pharmacist–administered influenza immunization improves patient access. **Can Pharm J**. 2014;147(6):359–65.
10. Knip M, Siljander H. The role of infections in the pathogenesis of type 1 diabetes. **Curr Diab Rep**. 2008;8(2):87–94.
11. Einarson TR, Bereza BG, Acs A, Jensen R. Health economic implications of early detection by screening populations at risk for type 2 diabetes: a systematic review. **Curr Med Res Opin**. 2017;33(2):331–58. doi:10.1080/03007995.2016.1257977.
12. Centers for Disease Control and Prevention. Influenza vaccination in people with diabetes. **MMWR Morb Mortal Wkly Rep**. 2020;69(8):213–9.
13. Bertran EA, Berlie HD, Taylor A, Divine G, Jaber LA. Diagnostic performance of HbA1c for diabetes in Arab vs European populations: a systematic review and meta-analysis. **Diabet Med**. 2017;34(2):156–66. doi:10.1111/dme.13118.
14. Mehta SH, Brancati FL, Sulkowski MS, et al. Prevalence of type 2 diabetes mellitus among persons with hepatitis C virus infection. **Ann Intern Med**. 2000;133(8):592–9.
15. Somannavar S, Ganesan A, Deepa M, Datta M, Mohan V. Random capillary blood glucose cut points for diabetes and prediabetes derived from community-based opportunistic screening in India. **Diabetes Care**. 2009;32(4):641–3. Available from: PubMed.
16. Moberley S, Holden J, Tatham DP, Andrews RM. Vaccines for preventing pneumococcal infection in adults. **Cochrane Database Syst Rev**. 2013;(1):CD000422.
17. Apicella M, Campopiano MC, Mantuano M, et al. COVID-19 in people with diabetes: understanding the reasons for worse outcomes. **Lancet Diabetes Endocrinol**. 2020;8(9):782–92.
18. Advisory Committee on Immunization Practices. Adult immunization schedule. **MMWR Morb Mortal Wkly Rep**. 2023;72(5):1–20.\
19. Larson HJ, Jarrett C, Eckersberger E, et al. Understanding vaccine hesitancy. **Vaccine**. 2014;32(19):2150–9.
20. Warner JG, Portlock J, Smith J, Rutter P. Increasing seasonal influenza vaccination uptake using community pharmacies. **BMJ Open**. 2013;3:e003362.
21. Drozd EM, Miller L, Johnsrud M. Impact of pharmacist immunization authority on seasonal influenza vaccination rates. **J Am Pharm Assoc (2003)**. 2017;57(3):307–14.
22. Unnikrishnan R, Anjana RM, Deepa M, et al.; ICMR–INDIAB Collaborative Study Group. Glycemic control among individuals with self-reported diabetes in India: the ICMR–INDIAB Study. **Diabetes Technol Ther**. 2014;16(9):596–603. doi:10.1089/dia.2014.0018.
23. International Pharmaceutical Federation. **An overview of current pharmacy impact on immunisation**. The Hague: International Pharmaceutical Federation; 2020.
24. Thomas SS, et al. Role of the pharmacist in immunisation: a review. ijppr.human. 2020;20(1):127–38.

How to cite this article:
Abhinav Kumar Dokania. Ijppr.Human, 2026; Vol. 32 (2): 55-58.
Conflict of Interest Statement: All authors have nothing else to disclose.