



RESEARCH ARTICLE

Article DOI: 10.21474/JNHM01/151

DOI URL: <http://dx.doi.org/10.21474/JNHM01/151>

THE GROWING BURDEN OF TYPE 2 DIABETES MELLITUS: PREVENTION, MANAGEMENT, AND PUBLIC HEALTH PERSPECTIVES

Jonathan Reed, Priya Sharma, Carlos Mendes, Fatima Noor and Rebecca Collins

Manuscript Info

Manuscript History

Received: 26 January 2026

Accepted: 30 February 2026

Published: March 2026

Key words:-

Type 2 Diabetes Mellitus, Insulin Resistance, Obesity, Public Health, Prevention, Chronic Disease

Abstract

Type 2 Diabetes Mellitus (T2DM) has emerged as one of the most significant public health challenges of the 21st century. Characterized by insulin resistance and impaired glucose metabolism, T2DM affects millions of individuals worldwide and is associated with severe complications including cardiovascular disease, kidney failure, neuropathy, and vision impairment. Rapid urbanization, sedentary lifestyles, unhealthy dietary habits, and increasing obesity rates have contributed to the growing prevalence of the disease. This review examines the epidemiology, risk factors, complications, prevention strategies, and management approaches associated with Type 2 Diabetes Mellitus. Understanding these factors is essential for reducing disease burden and improving health outcomes globally.

"© 2026 by the Author(s). Published by JNHM under CC BY 4.0. Unrestricted use allowed with credit to the author."

Introduction:-

Diabetes Mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels resulting from defects in insulin production, insulin action, or both. Among the various forms of diabetes, Type 2 Diabetes Mellitus accounts for approximately 90–95% of all cases worldwide. The prevalence of T2DM has increased dramatically over the past few decades, becoming a major cause of morbidity and mortality. The disease not only affects individual health but also imposes substantial economic burdens on healthcare systems. As populations continue to age and lifestyles become increasingly sedentary, effective prevention and management strategies are essential. This review explores the current understanding of Type 2 Diabetes Mellitus and highlights evidence-based approaches for disease prevention and control.

Epidemiology of Type 2 Diabetes Mellitus:-

Type 2 Diabetes Mellitus affects hundreds of millions of people worldwide. The prevalence has increased significantly due to:

- Population aging
- Urbanization
- Reduced physical activity
- Increased obesity rates
- Unhealthy dietary patterns

Low- and middle-income countries are experiencing particularly rapid increases in diabetes prevalence due to changes in lifestyle and socioeconomic development. The disease affects individuals across all age groups, although

it is most common among adults over the age of 40. However, increasing rates of childhood obesity have led to a rise in T2DM among adolescents and young adults.

Pathophysiology of Type 2 Diabetes:-

Type 2 Diabetes develops when the body's cells become resistant to insulin, a hormone produced by the pancreas that regulates blood glucose levels.

Insulin Resistance:-**In insulin resistance:-**

- Muscle cells absorb less glucose.
- Liver cells produce excessive glucose.
- Fat cells release inflammatory substances.

As a result, blood glucose levels rise.

Beta-Cell Dysfunction:-

Over time, pancreatic beta cells become unable to produce sufficient insulin to compensate for insulin resistance, leading to persistent hyperglycemia.

Chronic Inflammation:-

Research suggests that chronic low-grade inflammation contributes significantly to the development and progression of Type 2 Diabetes.

Risk Factors:-**Obesity:-**

Obesity is the strongest modifiable risk factor for Type 2 Diabetes. Excess body fat, particularly abdominal fat, increases insulin resistance.

Physical Inactivity:-

Sedentary lifestyles contribute to weight gain and impaired glucose metabolism.

Unhealthy Diet:-**Dietary factors associated with increased diabetes risk include:-**

- Excessive sugar consumption
- Processed foods
- High saturated fat intake
- Low fruit and vegetable consumption

Family History:-

Individuals with a family history of diabetes have a higher risk of developing the disease.

Age:-

The risk of Type 2 Diabetes increases with advancing age due to physiological changes and cumulative exposure to risk factors.

Hypertension and Dyslipidemia:-

High blood pressure and abnormal cholesterol levels frequently coexist with diabetes and contribute to disease progression.

Clinical Manifestations:-

Many individuals with Type 2 Diabetes remain undiagnosed for years because symptoms often develop gradually.

Common symptoms include:-

- Excessive thirst
- Frequent urination
- Increased hunger

- Fatigue
- Blurred vision
- Slow wound healing
- Unexplained weight loss

Early diagnosis is essential for preventing complications.

Complications of Type 2 Diabetes:-

Cardiovascular Disease:-

Cardiovascular complications are the leading cause of death among diabetic patients.

These include:-

- Coronary artery disease
- Heart attack
- Stroke
- Peripheral vascular disease

Diabetic Nephropathy:-

Long-term elevated blood glucose levels can damage kidney function, potentially leading to chronic kidney disease and kidney failure.

Diabetic Neuropathy:-

Nerve damage caused by diabetes may result in:-

- Numbness
- Tingling sensations
- Pain
- Loss of sensation in extremities

Diabetic Retinopathy:-

Damage to retinal blood vessels can cause vision impairment and blindness if left untreated.

Foot Complications:-

Poor circulation and neuropathy increase the risk of foot ulcers and lower-limb amputations.

Prevention Strategies:-

Healthy Nutrition:-

A balanced diet is critical for preventing Type 2 Diabetes.

Recommended dietary practices include:-

- Increasing fruit and vegetable intake
- Consuming whole grains
- Reducing sugar-sweetened beverages
- Limiting processed foods
- Choosing healthy fats

Regular Physical Activity:-

Physical activity improves insulin sensitivity and helps maintain a healthy weight.

Adults should aim for:-

- At least 150 minutes of moderate exercise weekly
- Muscle-strengthening activities multiple times per week

Weight Management:-

Even modest weight loss can significantly reduce diabetes risk among overweight individuals.

Smoking Cessation:-

Smoking contributes to insulin resistance and increases the risk of diabetes-related complications.

Routine Screening:-

Regular health screenings help identify prediabetes and facilitate early intervention.

Management Approaches:-

Lifestyle Modification:-

Lifestyle interventions remain the foundation of diabetes management.

These include:

- Dietary counseling
- Exercise programs
- Weight reduction
- Stress management

Pharmacological Treatment:-

Several medications are available for glycemic control, including:-

- Metformin
- Sulfonylureas
- DPP-4 inhibitors
- GLP-1 receptor agonists
- SGLT2 inhibitors
- Insulin therapy

Treatment selection depends on patient-specific factors and disease severity.

Blood Glucose Monitoring:-

Regular monitoring helps evaluate treatment effectiveness and prevent complications.

Patient Education:-

Educating patients about self-management is essential for long-term disease control.

Important educational topics include:-

- Medication adherence
- Healthy eating
- Physical activity
- Foot care
- Monitoring blood glucose levels

Public Health Implications:-

The increasing prevalence of Type 2 Diabetes presents substantial challenges for healthcare systems worldwide.

Public health initiatives should focus on:-

- Health education campaigns
- Obesity prevention programs
- Promotion of physical activity
- Improved access to healthcare services
- Early screening and diagnosis

Collaborative efforts involving governments, healthcare professionals, educational institutions, and communities are necessary to reduce disease burden.

Future Perspectives:-

Advances in diabetes research continue to improve prevention and treatment strategies.

Future developments may include:-

- Precision medicine approaches
- Artificial intelligence-assisted disease monitoring
- Novel pharmacological therapies
- Improved wearable glucose monitoring devices
- Personalized lifestyle interventions

These innovations have the potential to improve patient outcomes and reduce healthcare costs.

Conclusion:-

Type 2 Diabetes Mellitus is a growing global health concern with significant medical, social, and economic consequences. The disease is largely influenced by modifiable lifestyle factors such as obesity, physical inactivity, and unhealthy dietary habits. Early diagnosis, preventive interventions, and comprehensive management strategies are critical for reducing complications and improving quality of life. Public health initiatives that promote healthy living and disease awareness will play an essential role in combating the global diabetes epidemic.

References:-

1. American Diabetes Association. Standards of Medical Care in Diabetes.
2. International Diabetes Federation. IDF Diabetes Atlas.
3. DeFronzo RA, Ferrannini E. Insulin resistance and Type 2 Diabetes Mellitus. *Diabetes Care*.
4. Zheng Y, Ley SH, Hu FB. Global causes of Type 2 Diabetes. *Nature Reviews Endocrinology*.
5. World Health Organization. Global Report on Diabetes.
6. Tuomilehto J, Lindström J, Eriksson JG, et al. Prevention of Type 2 Diabetes by lifestyle intervention.
7. Nathan DM. Long-term complications of diabetes mellitus.
8. Knowler WC, Barrett-Connor E, Fowler SE, et al. Reduction in the incidence of Type 2 Diabetes with lifestyle intervention.