

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder defined by persistent hyperglycemia due to insulin resistance and progressive β -cell dysfunction, in contrast to type 1 diabetes mellitus (T1DM), which stems from autoimmune destruction of pancreatic β -cells. The multifactorial nature of T2DM includes genetic predisposition, obesity, physical inactivity, chronic inflammation, and gut microbiome dysregulation (5,8,9). The interplay between insulin resistance and β -cell failure worsens glycemic control over time (5,8). Globally, T2DM affects over 400 million people, with rising prevalence linked to aging, urbanization, and obesity (7). It incurs significant healthcare costs due to complications, including microvascular issues (retinopathy, nephropathy, neuropathy) and macrovascular complications (atherosclerosis, cardiovascular diseases) (5,8). Additionally, comorbidities like obesity and nonalcoholic fatty liver disease are common among patients (2,5,9). Management strategies include lifestyle interventions, such as dietary changes and regular physical activity, along with cognitive-behavioral therapy to support adherence (7,8). Pharmacologically, metformin is the first-line agent, with SGLT2 inhibitors and GLP-1 receptor agonists as advanced therapies. Other agents target specific comorbidities or complications as needed (7-8). Surgical options like bariatric surgery are effective for obese individuals where choice of procedure and patient factors (age, baseline HbA1c, diabetes duration) influence outcomes (6-9). Technology, such as continuous glucose monitoring, plays a role in improving patient management, while research continues on emerging therapies and personalized medicine approaches to enhance treatment outcomes (4,8).