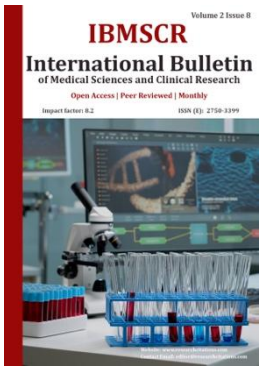


# PREVALENCE OF DIABETES MELLITUS AMONG YOUNG PEOPLE AND ITS RISK FACTORS

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**Abstract**

Diabetes mellitus is one of the most important medical and public health problems of the modern era. Although type 2 diabetes mellitus has traditionally been considered a disease of adults, its prevalence among children, adolescents, and young people has increased in recent decades. Obesity and overweight, physical inactivity, unhealthy dietary patterns, family history of diabetes, insulin resistance, pubertal hormonal changes, and certain socioeconomic factors are among the major risk factors associated with the development of type 2 diabetes in young people.

At the same time, type 1 diabetes mellitus remains an important form of diabetes among children and adolescents and is primarily associated with autoimmune destruction of pancreatic beta cells. According to epidemiological data from the United States, between 2002 and 2018, the incidence of newly diagnosed type 2 diabetes among people younger than 20 years increased from 9 to 18 cases per 100,000 population, representing approximately a two-fold increase.

The purpose of this article is to analyze the prevalence of diabetes mellitus among young people, identify major risk factors, describe clinical manifestations and diagnostic approaches, and discuss effective prevention strategies. Particular attention is given to obesity, physical inactivity, unhealthy nutrition, genetic predisposition, puberty, insufficient sleep, and socioeconomic factors.

The analysis of scientific literature demonstrates that early identification of risk factors, healthy nutrition, regular physical activity, adequate sleep, maintenance of a healthy body weight, and appropriate screening of high-risk young people are important measures for preventing or delaying the development of type 2 diabetes mellitus.

**Keywords:** diabetes mellitus, young people, adolescents, type 1 diabetes, type 2 diabetes, insulin resistance, obesity, risk factors, glucose, insulin, prevention, screening.

## Introduction

Diabetes mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels resulting from inadequate insulin production, impaired insulin action, or a combination of these mechanisms.

Glucose is one of the major sources of energy for the cells of the human body. Insulin, a hormone produced by the beta cells of the pancreas, plays a central role in allowing glucose to enter cells and be used for energy.

Under normal physiological conditions, food is digested and carbohydrates are converted into glucose. Glucose enters the bloodstream, resulting in insulin secretion from the pancreas.

Insulin facilitates the uptake of glucose by cells, thereby maintaining blood glucose within an appropriate physiological range.

In diabetes mellitus, this regulatory mechanism becomes impaired. Persistent hyperglycemia can gradually damage blood vessels and nerves and may lead to complications affecting the cardiovascular system, kidneys, eyes, and other organs.

Diabetes among young people is particularly important because the disease may begin at an early stage of life. Consequently, affected individuals may live with diabetes for many decades, increasing their lifetime risk of developing chronic complications.

Type 2 diabetes mellitus among young people has become an increasing public health concern. According to the Centers for Disease Control and Prevention (CDC), the incidence of newly diagnosed type 2 diabetes among people younger than 20 years in the United States increased from 9 cases per 100,000 population in 2002 to 18 cases per 100,000 in 2018.

This trend demonstrates the increasing importance of diabetes prevention and early detection among children, adolescents, and young adults.

**Aim of the study**

The main aim of this scientific article is to analyze the prevalence of diabetes mellitus among young people and to identify the major risk factors associated with its development based on contemporary scientific literature.

Objectives of the Study

The objectives of the study are:

To describe the general concept of diabetes mellitus.

To explain the differences between type 1 and type 2 diabetes mellitus.

To analyze epidemiological trends in diabetes among young people.

To identify major risk factors for diabetes.

To examine the role of obesity and insulin resistance.

To assess the importance of genetic predisposition.

To analyze the effects of unhealthy nutrition and physical inactivity.

To examine the role of puberty in the development of type 2 diabetes.

To describe the major clinical manifestations of diabetes among young people.

To discuss methods of early diagnosis and prevention.

**Materials and methods**

This article was prepared as a literature review.

Scientific publications concerning diabetes mellitus, pediatric and adolescent diabetes, obesity, insulin resistance, metabolic disorders, and diabetes prevention were analyzed.

The main sources included:

PubMed/MEDLINE;

Centers for Disease Control and Prevention (CDC);

International Society for Pediatric and Adolescent Diabetes (ISPAD);

American Diabetes Association;

scientific publications in the fields of endocrinology, pediatrics, and public health.

The following research methods were used:

literature analysis;

comparative analysis;

epidemiological data analysis;

classification of risk factors;

generalization of clinical evidence;

analysis of preventive strategies.

CHAPTER I. GENERAL CONCEPT OF DIABETES MELLITUS

Definition of Diabetes Mellitus

Diabetes mellitus is a group of chronic metabolic diseases characterized by persistent elevation of blood glucose.

The disease develops when:

the pancreas does not produce sufficient insulin;

the body cannot use insulin effectively;

or both mechanisms occur simultaneously.

Insulin is produced by pancreatic beta cells and is essential for maintaining normal blood glucose levels.

The physiological process can be represented as follows:

Food → glucose → absorption into the bloodstream → insulin secretion → glucose uptake by cells → energy production

In diabetes mellitus, this process is disrupted.

Main Types of Diabetes Mellitus

There are several forms of diabetes mellitus. The two major types are type 1 and type 2 diabetes.

Type 1 Diabetes Mellitus

Type 1 diabetes is generally associated with an autoimmune process in which the immune system attacks and destroys insulin-producing beta cells of the pancreas.

As a result, insulin production becomes severely reduced or completely absent.

Type 1 diabetes frequently develops during childhood, adolescence, or young adulthood.

People with type 1 diabetes require insulin treatment to maintain normal glucose metabolism.

Unlike type 2 diabetes, type 1 diabetes is not primarily caused by obesity or an unhealthy lifestyle.

Type 2 Diabetes Mellitus

Type 2 diabetes is primarily associated with insulin resistance and progressive impairment of pancreatic beta-cell function.

In insulin resistance, body cells do not respond adequately to insulin. Initially, the pancreas may compensate by producing additional insulin.

However, if insulin resistance persists, beta-cell function may gradually decline. As a result, blood glucose levels increase and type 2 diabetes may develop.

In young people, obesity and insufficient physical activity are important risk factors for type 2 diabetes.

CHAPTER II. PREVALENCE OF DIABETES AMONG YOUNG PEOPLE

Epidemiological Trends

Diabetes among children and young people has become an increasingly important public health concern.

One of the most significant changes in recent decades has been the increasing occurrence of type 2 diabetes in younger age groups.

According to CDC data, among people younger than 20 years in the United States, the incidence of newly diagnosed type 2 diabetes increased from:

Sex Differences

Some populations demonstrate differences in the incidence of type 2 diabetes between males and females.

In several studies, type 2 diabetes has been observed more frequently among adolescent girls.

Possible contributing factors include:

obesity;

pubertal hormonal changes;

insulin resistance;

polycystic ovary syndrome;

differences in body composition.

However, the magnitude of these differences varies among populations.

CHAPTER III. MAJOR RISK FACTORS FOR DIABETES AMONG YOUNG PEOPLE

Obesity

Obesity is one of the most important modifiable risk factors for type 2 diabetes among young people.

Excess adipose tissue, particularly visceral fat, can contribute to insulin resistance.

The process may be summarized as:

Obesity → insulin resistance → increased insulin secretion → pancreatic beta-cell stress → impaired glucose regulation → type 2 diabetes

The increasing prevalence of childhood and adolescent obesity is therefore closely related to the growing burden of youth-onset type 2 diabetes.

Physical Inactivity

Regular physical activity improves insulin sensitivity and contributes to maintaining a healthy body weight.

During physical activity, skeletal muscles increase glucose utilization.

In contrast, insufficient physical activity may result in:

Low physical activity → reduced energy expenditure → weight gain → insulin resistance → increased diabetes risk

Young people who spend large amounts of time sitting, watching television, playing video games, or using smartphones may have lower overall physical activity.

Therefore, increasing daily physical activity is an important component of diabetes prevention.

Unhealthy Diet

Dietary habits have a major influence on metabolic health.

A diet characterized by excessive consumption of:

sugar-sweetened beverages;

fast food;

highly processed foods;

high-calorie snacks;

foods rich in saturated fats;

large portion sizesc may contribute to obesity and insulin resistance.

On the other hand, a balanced diet containing vegetables, fruits, whole grains, legumes, adequate protein, and healthy fats can support metabolic health.

Reducing consumption of sugar-sweetened beverages is particularly important because these beverages can provide substantial amounts of rapidly absorbed calories.

Family History of Diabetes

Family history is an important risk factor for type 2 diabetes.

Young people with a parent or close relative who has type 2 diabetes may have an increased risk of developing the disease.

This association reflects both:

genetic susceptibility;

shared environmental and behavioral factors.

Families often share dietary patterns, physical-activity habits, and socioeconomic conditions.

Therefore, family-based prevention strategies may be particularly effective.

Maternal Diabetes During Pregnancy

Maternal metabolic health can influence the future health of offspring.

Maternal diabetes during pregnancy, including gestational diabetes, may increase the child's risk of developing obesity and type 2 diabetes later in life.

This demonstrates that diabetes prevention may need to begin before birth and continue throughout childhood and adolescence.

Puberty

Puberty is characterized by major hormonal changes.

During this period, physiological insulin resistance may increase.

Most healthy adolescents compensate through increased insulin secretion.

However, if insulin resistance is combined with obesity or genetic susceptibility, the risk of developing type 2 diabetes increases.

Therefore, puberty represents an important period for identifying young people at increased metabolic risk.

Sleep Deprivation

Sleep plays an important role in metabolic health.

Insufficient sleep may contribute to:

increased appetite;

weight gain;

impaired insulin sensitivity;

hormonal disturbances;

reduced physical activity.

Young people frequently experience inadequate sleep because of school or university workload, electronic-device use, social activities, and irregular schedules.

The major risk factors for youth-onset type 2 diabetes include obesity, physical inactivity, unhealthy dietary patterns, family history, insulin resistance, puberty, maternal diabetes, inadequate sleep, hypertension, dyslipidemia, and socioeconomic factors.

Early prevention is essential. Healthy eating, regular physical activity, adequate sleep, maintenance of a healthy body weight, and appropriate medical screening can reduce the risk of type 2 diabetes and its complications.

In addition, young people who develop diabetes require not only medical treatment but also psychological, family, educational, and social support.

In conclusion, preventing diabetes among young people should be regarded as a long-term investment in public health. Early intervention can reduce the future burden of chronic disease and improve quality of life.

PRACTICAL RECOMMENDATIONS

For Young People

Reduce consumption of sugar-sweetened beverages.

Eat more vegetables, fruits, whole grains, and other nutrient-rich foods.

Engage in regular physical activity.

Reduce prolonged sedentary behavior.

Maintain adequate sleep.

Maintain a healthy body weight.

Avoid smoking and other harmful habits.

Be aware of family history of diabetes.

Seek medical evaluation if symptoms such as excessive thirst, frequent urination, or unexplained weight loss develop.

Do not take medications or follow restrictive diets without medical advice.

For Parents

Encourage healthy eating habits at home.

Promote regular physical activity.

Establish a consistent sleep schedule.

Monitor excessive screen time.

Seek professional advice when a child has overweight or obesity.

Inform healthcare professionals about a family history of diabetes.

For Healthcare Professionals

Identify young people at increased risk of type 2 diabetes.

Assess body mass index and growth patterns.

Monitor blood pressure.

Assess glucose metabolism when clinically indicated.

Collect detailed family history.

Provide lifestyle counseling.

Consider appropriate screening in high-risk adolescents.

Assess psychological well-being in young people with diabetes.

Educate families about diabetes prevention and management.

Encourage long-term follow-up of high-risk patients.

## References:

1. Shah A.S., Barrientos-Pérez M., Chang N. et al. ISPAD Clinical Practice Consensus Guidelines 2024: Type 2 Diabetes in Children and Adolescents. Pediatric Diabetes. 2025;97(6):555–583.
2. Centers for Disease Control and Prevention. Preventing Type 2 Diabetes in Kids. CDC, 2024.
3. Centers for Disease Control and Prevention. Trends in Diabetes Among Young People. CDC, 2024.
4. Centers for Disease Control and Prevention. About Type 1 Diabetes. CDC, 2024.

5. Centers for Disease Control and Prevention. Diabetes Risk Factors. CDC, 2024.
6. American Diabetes Association. Standards of Care in Diabetes. Diabetes Care.
7. International Society for Pediatric and Adolescent Diabetes. ISPAD Clinical Practice Consensus Guidelines.
8. World Health Organization. Diabetes — Fact Sheet.
9. International Diabetes Federation. IDF Diabetes Atlas.
10. American Diabetes Association. Classification and Diagnosis of Diabetes: Standards of Care in Diabetes.