

# A REVIEW DIABETES AND BLOOD PRESSURE EFFECTS ON LIVER, HEART, AND KIDNEY DUE TO EATING HABITS AND LIFESTYLE

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## **ABSTRACT**

*Diabetes and hypertension, especially when combined with poor diet and lifestyle, damage the liver, heart, and kidneys. Processed meals heavy in sugar, salt, and bad fats raise blood glucose and blood pressure, straining these important organs. High blood sugar from diabetes can compromise the kidneys' filtration capacity, leading to chronic kidney disease or kidney failure. High blood pressure stresses the kidney, heart, and liver blood vessels, causing hypertensive nephropathy, liver fibrosis, and heart disease. A sedentary lifestyle and lack of exercise increase the risk of obesity and metabolic syndrome, which strains these organs. Lifestyle factors can cause the liver, which processes nutrients and detoxifies the body, to become fatty and inflammatory, lowering its efficiency and causing fatty liver disease. High blood pressure and inadequate nutrition strain the heart, making it work harder to pump blood through restricted or clogged arteries, causing cardiovascular illnesses. A balanced diet of healthy foods, frequent exercise, and medical checkups can avoid these cascade consequences.*

**Keyword:** - Diabetes, Hypertension, Blood pressure, Liver health, Heart health, Kidney health.

## **INTRODUCTION**

The good news is that there is some degree of control over environmental influences, which means that disease resulting from these causes can be significantly prevented from manifesting. A person's diet is one of the most important variables that has been connected to a variety of illnesses. One of these ailments is diabetes, for instance. One of the most important factors that determines human health is the quantity and kind of food that is consumed. Diabetes care involves nutrition in three different forms: diet on its own, diet in combination with oral hypoglycemic medications, or diet in combination with insulin. Food is one of the most crucial components of diabetes management. A person's food has a major role in diabetes management. between the ages of 10 and 15 A person's diet is tailored to meet their individual needs by considering a number of factors, such as their age, weight, gender, occupation, health, and other factors. These dietary guidelines are collections of brief recommendations for managing the diabetic population's nutrition. Because of their efficacy, these suggestions were used in this inquiry. The development of these recommendations aims to improve general nutritional health, control glycoemic levels, and avoid or mitigate diabetes-related problems.

## OBJECTIVE

1. To gain an understanding of how people's perceptions and attitudes regarding blood pressure and diabetes affect their lives; and
2. To understanding of how people with diabetes and high blood pressure adjust to their lives

## MELLITUS, OFTEN KNOWN AS DIABETES

The chronic medical disorder known as diabetes is characterized by the body's incapacity to either create or effectively haract insulin, a hormone that regulates blood sugar levels. People with diabetes are impacted by the disease known as diabetes. The two fundamental categories that may be used to categorise problems related to diabetes are type 1 diabetes and type 2 diabetes.

There is a condition known as type 1 diabetes, which happens when the immune system erroneously attacks and destroys the pancreatic cells that are responsible for the production of insulin. Higher levels of blood sugar are observed throughout the body as a consequence of the decreased production of insulin by the body.

There is a significant proportion of the younger population that is affected by type 1 diabetes. People who have this ailment, which needs them to take insulin for the rest of their lives, must make sure that they keep their blood sugar levels at a healthy range. One of the defining characteristics of this condition is the extremely high frequency with which it arises. In contrast to type 1 diabetes, type 2 diabetes is characterised by the body's inability or resistance to create sufficient insulin to fulfil its needs. This is the distinguishing characteristic of type 2 diabetes. Insulin resistance is a hallmark of type 1 diabetes. Type 2 diabetes is typically linked to lifestyle factors such as being overweight, having an unhealthy diet, and not getting enough exercise. Making lifestyle adjustments, such as improving one's nutrition and increasing regular physical exercise, can help manage the disease. But occasionally, medicine could also be required to effectively treat the illness.

## Diabetes: Symptoms and Signs of the Condition

Several signs, the most notable being polydipsia (increased thirst), polyphagia (increased hunger), and polyuria (increased urine), are indicative of untreated diabetes. Unintentional weight loss is another indicator that diabetes is present. Although symptoms of diabetes might develop suddenly (in a matter of weeks or months), they usually do so much more gradually (over the period of years or decades), and they can be mild or nonexistent. To put it another way, the signs of diabetes might be rather mild. Fatigue and weight loss are only two of the symptoms that are associated with diabetes.

## Diabetes and Dietary Habits

Research has shown a connection between the traditional food pattern and a considerable decrease in the risk of type 2 diabetes, as well as the beneficial effects that the dietary pattern has on diabetes mellitus and glucose metabolism in general. Conversely, the eating pattern places emphasis on fat consumption, which is frequently obtained from foods high in unsaturated fatty acids. Furthermore, it encourages regular consumption of entire grains, dairy products with low fat content, fruits, and vegetables. It also recommends a very minimal intake of fish, poultry, lentils, tree nuts, and very little red meat. Legumes

are among the other food items that are advised. The 18–20th of Food composition is one of the most well-known patterns of nutrition because of its positive impacts on human health. It may have protective effects against the onset of type-2 diabetes, including a decrease in insulin resistance and oxidative stress. This is among the potential advantages. A diet heavy in fruits, vegetables, legumes, nuts, fish, cereals, and oil results in a low intake of trans fats, a high intake of dietary fibre, antioxidants, and polyphenols, and a high ratio of monounsaturated to saturated fatty acids. All of them are good for one's health. It is thought that eating specific meals would be the cause of these advantageous effects.

## **PRESSURE OF THE BLOOD**

The force that the blood exerts on the blood vessel walls as it passes through the circulatory system is referred to as "blood pressure". The majority of this pressure is inherent because the heart is the organ responsible for circulating blood throughout the circulatory system. The most common location for such measures is the brachial artery, where blood pressure is determined. Without any qualifiers, "blood pressure" refers to the pressure that is measured in the brachial artery. Blood pressure is often represented in terms of the cardiac cycle as the systolic pressure, which is the maximum pressure that is experienced during a single pulse as opposed to the diastolic pressure, which is the lowest pressure that is experienced between two heartbeats. The maximum pressure experienced in a single pulse is known as the systolic pressure. Depending on the unit of measurement, it can be expressed in either kilopascals (kPa) or millimetres of mercury (mmHg). The measurement is made using the atmospheric pressure as a reference point. The difference in pressure that occurs throughout a heart cycle from the systolic to the diastolic phases is known as the pulse pressure. Conversely, the average pressure that exists inside a cardiac cycle is known as the mean arterial pressure. The pulse pressure is the term used to describe both of these pressures.

Traditionally, auscultation was used by a medical professional to take a patient's blood pressure non-invasively. Using either an aneroid gauge or a mercury-tube sphygmomanometer, the artery in one arm is pushed closer to the heart while a stethoscope is used to listen for sounds in the artery. Auscultation is referred to as such. In clinical settings, auscultation is still considered the gold standard of accuracy for non-invasive blood pressure measurements. This is thus because the most dependable technique is auscultation. Nevertheless, semi-automated procedures are becoming more typical across a number of sectors. But other factors that have contributed to defining this trend include affordability, ease of use, and applicability to home or mobile blood pressure measurements. The main cause of this is the worries expressed about the possible toxicity of mercury. Achieving a standard deviation of less than 8 mm Hg and an average difference between two standardised reading processes of less than 5 mm Hg is feasible with contemporary technologies that have been verified to meet international standards. To put this in context, the early automated sphygmomanometer replacements that used mercury tubes were typically not that accurate. This is different from how things are right now. An oscillometer is the main instrument used by the great majority of these semi-automated blood pressure monitoring systems. This specific type of measuring measurement is performed using a pressure transducer that is built into the device's tube. This is accomplished by monitoring the brief intra-cuff pressure oscillations that result from changes in each pulse's volume caused by the heartbeat.

Medical practitioners consider a number of vital indicators while doing a patient's health examination, including the patient's blood pressure, heart rate, respiration rate, oxygen saturation, and body temperature.

The blood pressure is one of the essential indications. The phrase "120/80 mmHg" describes an adult's typical resting blood pressure, which is around 120 mmHg (16 kPa) systolic over 80 mmHg (11 kPa) diastolic. This serves as the benchmark for an adult's normal blood pressure. Age-standardized average blood pressure hasn't changed much between 1975 and the present, even if these average figures hide wildly varied regional variations. The average blood pressure of males is around 127/79 mmHg, whereas the average blood pressure of females is 122/77 mmHg.

## THE LIFESTYLE

Every individual, group, and culture possesses a unique set of pursuits, mindsets, customs, and behavioural patterns that make up their way of life. Their way of life is composed of these components. The phrase "a person's basic character as established early in childhood" was first used in 1929 by Austrian psychologist Alfred Adler in his book "The Case of Miss R." The idea was initially introduced in Adler's book. The concept of lifestyle was established in 1961 as a "way or style of living." This is a more thorough explanation of lifestyle than I just gave. A certain manner of living is made up of a number of components, some tangible and some more ethereal. Certain characteristics are deemed tangible because they are particularly related to demographic parameters, often known as a person's demographic profile. Conversely, intangible factors pertain to an individual's psychological makeup, including their distinctive characteristics, inclinations, and perspectives. These are the variables that distinguish themselves from material elements.

The daily habits of those who live in large cities and those who live in rural areas differ greatly. Even when viewed within the context of an urban setting, location has relevance. The kind of neighbourhood a person lives in affects the range of lifestyle options accessible to them since different communities have varying levels of wealth and accessibility to natural and cultural environments. This is due to the varying degrees of accessibility that distinct communities have to their natural and cultural environments. Take the popularity of a surf culture or lifestyle in places that are near to the ocean as an example of this.

A person's manner of life, worldview, views, and opinions on the world are typically reflected in their lifestyle. Following a certain way of life may help one build a sense of self and produce cultural symbols that are consistent with their own identity. Certain elements of a person's lifestyle are not something they can control. The social and technical structures that exist in an individual's surroundings may limit their ability to project particular symbols onto other people and onto themselves. Additionally, there's a chance that this will limit their options for lifestyle.

- **The Connection between Diet and Diabetes Type 2**

As was previously noted, Indians were the first to propose that nutrition was a major factor in the development of type 2 diabetes. After observing that the sickness was virtually exclusively seen in wealthy individuals who overindulged in bread, sugar, and oil, they arrived at this conclusion. Food shortages and famines in the nations that fought in both World Wars, such as Germany and other European countries, were shown to have reduced thirty percent of the death rates associated with diabetes. This decrease was seen. Between 1914 and 1919, the percentage of diabetes-related mortality in Berlin fell from 23.1/100,000 to 10.9. On the other hand, the death rate from diabetes did not alter in other nations where there was no food crisis during the same period of time.

- **Dietary Knowledge of Individuals with Type 2 Diabetes**

Self-dietary management is the first step towards equipping diabetics with the skills and information necessary to control their disease, nutrition, medicines, and complications, according to the American Diabetes Association. Research found that the targeted population, those who are at a high risk of acquiring type 2 diabetes, did not know enough about nutrition. Compared to females, males were found to consume more red meat and fried foods. The proportion of males who ate rice daily was far higher than anticipated when compared to women. Saudi Arabia has seen a significant increase of food options, portion sizes, and the prevalence of sedentary lifestyles, all of which increase the risk of obesity

## **HYPERTENSION**

India is seeing an increase in the prevalence of cardiovascular disease (CVD) and hypertension, which calls for immediate attention as a matter of public health. Optimal, resource-sensitive, and context-specific use of a blend of clinical and population techniques is the most efficient way to achieve this. The International Diabetes Federation (2014) states that in the year 2010, hypertension was one of the leading noncommunicable illnesses that caused a considerable number of deaths and disabilities worldwide. 9.4 million fatalities and 7% of Disability Adjusted Life Years (DALYs) in 2010 were attributed to hypertension. There are many challenges ahead in the pursuit of the WHO-UN target of a 25% fall in mortality from noncommunicable diseases and a corresponding drop in hypertension by 2025, but the opportunities to spur action are equally encouraging.

Hypertension, commonly referred to as high blood pressure (BP), is a major global public health issue that is prevalent in all cultures. A person is considered to have hypertension if their diastolic blood pressure (DBP) is more than or equal to 90 mmHg and their systolic blood pressure (SBP) is equal to or more than 140 mmHg, as per the guidelines set by the World Health Organisation (WHO). A mercury sphygmomanometer is used to measure blood pressure for diagnostic purposes. The measuring method can be either auscultatory or palpatory (Martin, 2008). Among the several NCDs, hypertension ranks high in prevalence. Worldwide, hypertension affected an estimated 600 million individuals in 2002, according to a World Health Organization assessment. A quarter of all deaths worldwide happened due to this disease, accounting for an estimated 50 million premature deaths (Kannel and MaGree, 1979; Medhi et al., 2006). The "Global Burden of Hypertension" data, which came from a 2002 research by the World Health Organisation (WHO), showed that in 2000, hypertension afflicted about one billion adults worldwide, or more than 25% of the world's adult population. Moreover, an almost sixty percent growth in this figure was projected, bringing the total to 1.56 billion by 2025.

**Physiopathology and treatment of diabetes and hypertension:** Studies involving large populations of industrialized nations have revealed higher rates of cohabitation between diabetes mellitus and hypertension than those found in traditional literature. These rates range from 60 to 65%.<sup>1</sup> It is also known that individuals with diabetes have a two- to three-fold increased frequency of high blood pressure. These illnesses are separate risk factors for cardiovascular disease, and when they combine, the mortality and morbidity rates for those conditions rise by two to eight times, respectively.<sup>1, 2</sup> This association can be explained by the following factors: (1) the frequency of both diseases rises with age; (2) they share the same predisposing factors; (3) hypertension in type 1 diabetes is secondary to the diabetic complications, which are typically nephropathy; and (4) hypertension in type 2 diabetics may precede or be associated



with diabetic nephropathy. While it is unclear if type 1 diabetes has a greater incidence of hypertension than type 2 diabetes, the incidence of hypertension in type 1 diabetics is close to 40%.

**Diabetes-related arterial hypertension pathogenesis:** Diabetes mellitus is a chronic, genetically determined illness that is greatly impacted by external circumstances. It may manifest in one of three ways: As a vascular syndrome, characterised by macroangiopathic changes that affect all organs, especially the heart, brain, kidney, and retina, and (b) a microangiopathic component that affects the microcirculation and primarily causes endothelial dysfunction; (2) as a metabolic syndrome, which includes hyperglycemia, glycosuria, polyphagia, polydipsia, polyuria, and changes in lipid and protein metabolisms caused by a complete or partial lack of insulin action and/or peripheral resistance to the insulin effect; (3) as a peripheral or autonomous neuropathic syndrome that causes vascular dysfunction.

**Atherosclerosis and insulin:** Atherosclerosis susceptibility, secondary hyperinsulinism, and decreased sensitivity to the effects of insulin are related. Because insulin appears to have a direct influence on the hepatocytes that produce PAI-1, high levels of insulin are linked to higher amounts of PAI-1 (plasminogen type I inhibitor). Thus, elevated levels of PAI-1 and the resulting inhibition of fibrinolysis mediate some of the atherogenic impact of insulin. In individuals with ischemic cardiopathy, PAI-1 is inversely correlated with triglyceride levels; moreover, it is present in high amounts in atheromatous lesions. High levels of PAI-1 are linked to hyperinsulinism and hypertriglyceridemia in obese patients with type II diabetes.

## CONCLUSION

There is a widespread misconception that diabetes and high blood pressure are relatively common health conditions; nonetheless, the dangers that are linked with these disorders are quite severe. As a consequence of this, it is challenging for people who have diabetes and high blood pressure to deal with the usual and ordinary aspects of life. It should come as no surprise that people's eating and living habits, particularly in metropolitan areas, have contributed to an increase in the prevalence of diabetes and high blood pressure. The general public has to be made aware of these ailments and should recognise that these issues become more significant beyond the middle age. The members of the family are obligated to take preventative measures if a member of the family becomes afflicted with certain illnesses. This is to ensure that the affected family members maintain control over their diet and weight, hence reducing the likelihood of the individual's death. In order to achieve this goal, it is necessary to interact with dietitians and medical practitioners on a consistent basis.

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