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# Type 2 Diabetes Mellitus in India -A Ticking Time Bomb

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**Abstract**

Diabetes has reached epidemic proportions in many developing economies, such as India. According to WHO, the prevalence of diabetes is growing most rapidly in low- and middle-income countries. The rapid socioeconomic change in conjunction with urbanization and industrialization are the major factors for the global increase in the diabetes epidemic, with other associated risk factors such as population growth, unhealthy eating habits, and a sedentary lifestyle also playing an important role.

A major cause for concern is that Type 2 diabetes which used to be seen in older adults is increasing being seen in teenagers and younger adults. Also worrying is that more than 50 % of individuals have undiagnosed diabetes due to less developed health systems in India.

**Introduction**

India will soon acquire the title of being the 'Diabetes Capital of the world'. The estimates in 2019 showed that 77 million individuals had diabetes in India, which is expected to rise to over 134 million by 2045. Approximately 57% of these individuals remain undiagnosed.

According to the World Health Organization (WHO), noncommunicable diseases (NCDs) accounted for 74% of deaths globally in 2019, of which, diabetes resulted in 1.6 million deaths, thus becoming the ninth leading cause of death globally. By the year 2035, nearly 592 million people are predicted to die of diabetes.

**Objectives**

- To understand Type 2 Diabetes
- To study the Socio-Economic Impact of Type2 Diabetes Mellitus
- To analyse Diabetes prevention and control methods

**Methodology**

Secondary data source is from books, journals,newspapers and internet etc.

**Type 2 Diabetes**

Type 2 Diabetes Mellitus is an endocrine condition where insulin secreted by the pancreas do not work properly or the pancreas are not able to make enough insulin. This results in high blood glucose in the blood stream. Poorly controlled diabetes can affect the heart, brain, eyes, kidneys and feet. They also increase the risk of having infections. The complications of diabetes are a major cause for premature mortality and morbidity. This leads to reduced life expectancy and increased financial and other impacts to the patients. This causes an enormous economic burden on the patient and the Indian health system.

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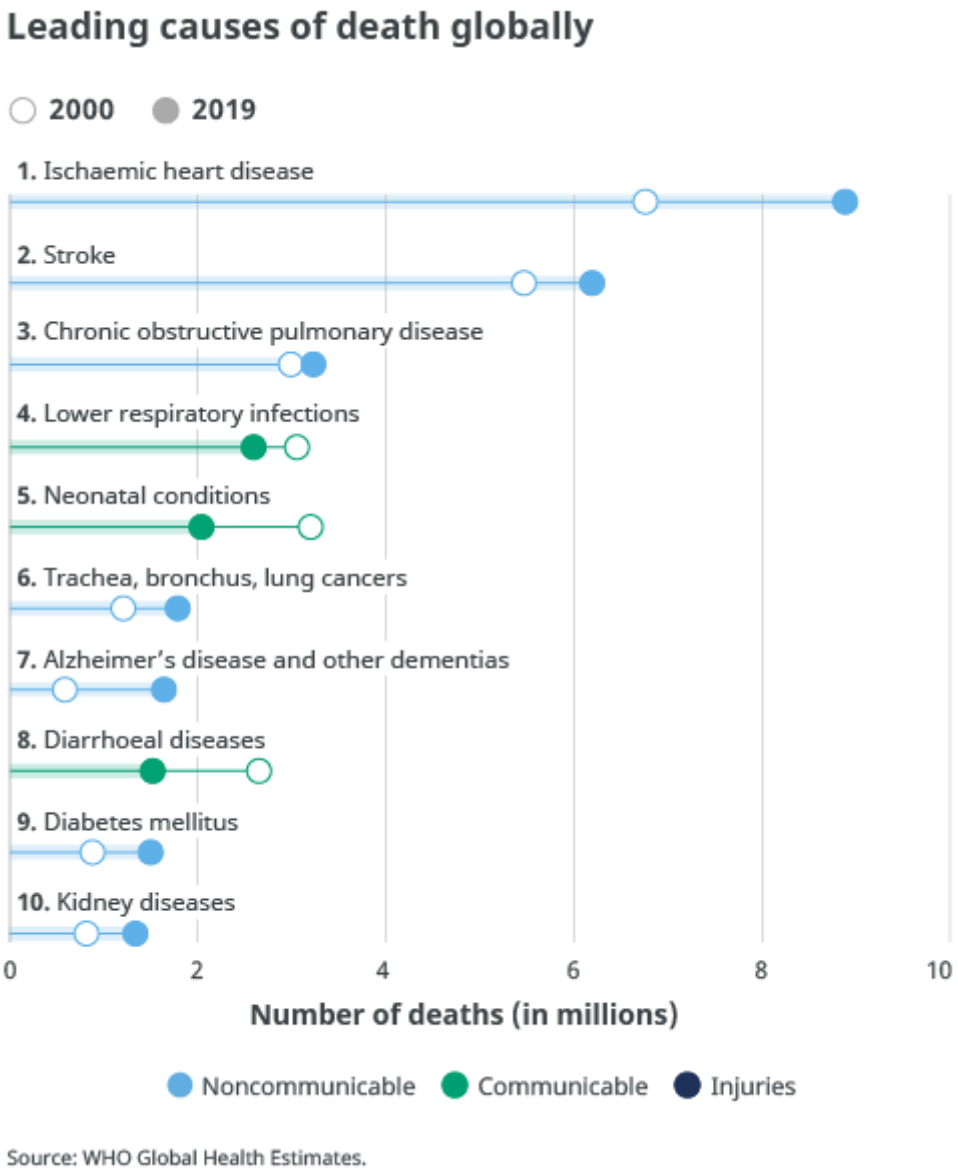
**Symptoms**

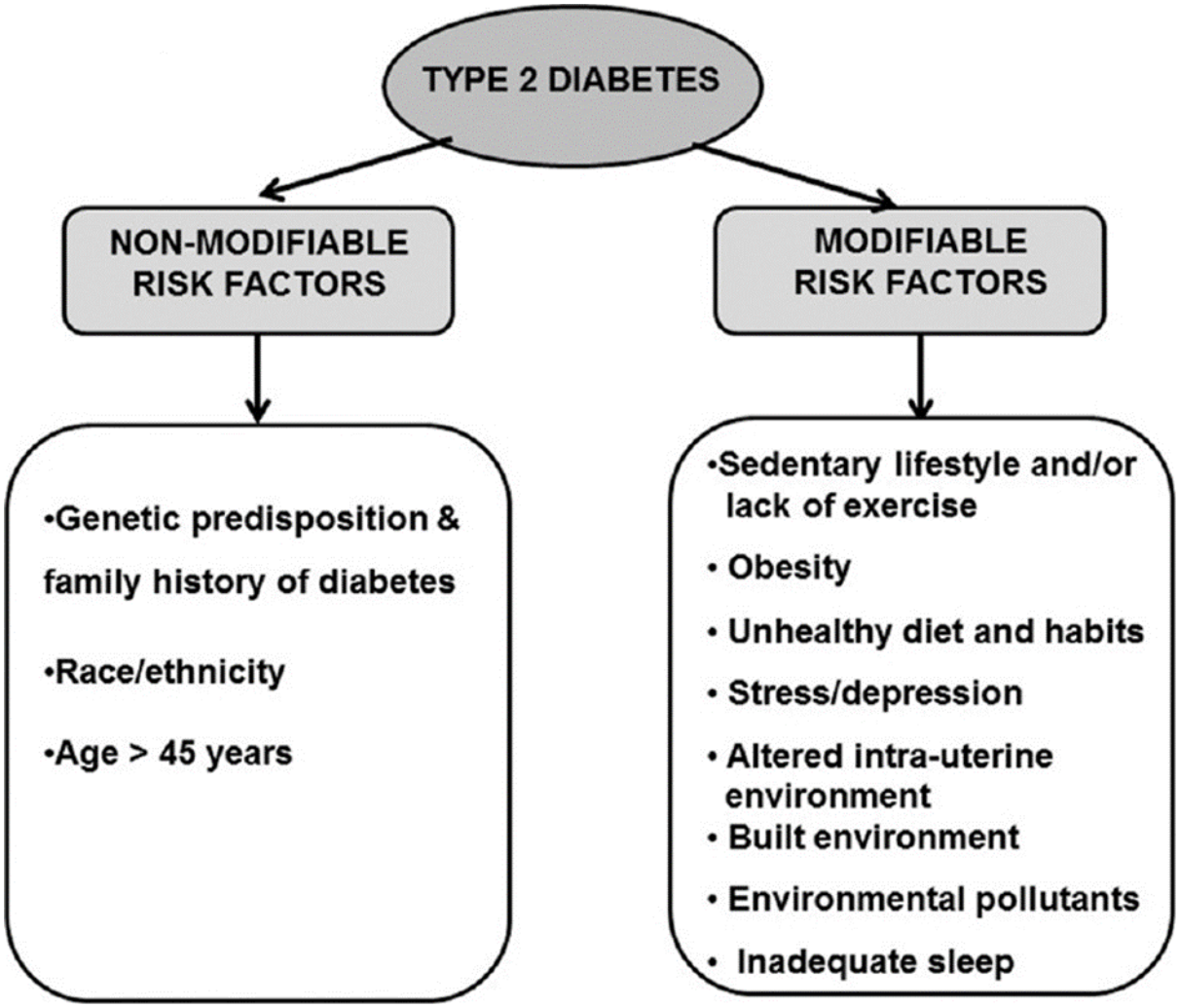
Symptoms of type 2 diabetes include the need to urinate often, thirst, constant hunger, weight loss, vision changes and fatigue. These symptoms may be less marked. As a result, the disease may be diagnosed several years after onset, after complications have already arisen. For this reason, it is important to be aware of risk factors.



**Risk factors**

Risk factors for type 2 diabetes are multifactorial. The risk of developing diabetes increases with obesity, having a sedentary life style, unhealthy diet, stress, smoking and alcohol excess. People have moved away from having traditional Indian home cooked foods. There is easy access to cheap take aways [foods high is refined grains, fat, salt and sugar] and decreased intake of fruits and vegetables.

Indians also appear to have a genetic and racial predisposition to developing diabetes at an early age and at a lower BMI unlike their Caucasian counterparts. Type 2 diabetes also appears to run in families.




**Treatment**

Early diagnosis can be accomplished through testing of blood glucose.

Treatment of diabetes involves diet and physical activity along with lowering of blood glucose and the levels of other known risk factors that damage blood vessels. Tobacco use cessation is also important to avoid complications.

Interventions that are essential include blood glucose control, for type 2 diabetes can be treated with oral medication, but may also require insulin;blood pressure control; andfoot care (patient self-care by maintaining foot hygiene; wearing appropriate footwear; seeking professional care for ulcer management; and regular examination of feet by health professionals).

Other interventions include:

- screening and treatment for retinopathy (which causes blindness);
- blood lipid control (to regulate cholesterol levels);
- screening for early signs of diabetes-related kidney disease and treatment.

If patients were to develop complications of diabetes like a heart attack, leg ulcers, kidney disease, stroke, cellulitisor eye problems they have to be managed accordingly.

**Socio-Economic Impact ofType2 Diabetes Mellitus**

The cost exerted by diabetes can be categorised into three groups: direct cost, indirect cost and intangible cost. Direct cost includes both direct health care costs (diagnosis, treatment, care and prevention) and direct non-health care costs (transport, housekeeping, social service and legal cost). Indirect cost includes cost for absenteeism, loss of productivity and disability. Lastly, intangible costs embrace cost for socialisolation and dependence, low socio-economic status, mental health and behavioural disorder and loss of quality of life

A large proportion of health care cost is confronted by the patients themselves, which affects the fulfilment of health care because of financial restraints. The proportion of public health expenditure by the Indian government is the lowest in the world. As a consequence, out-of-pocket (OOP) spending constitutes to be 70% of the total health expenditure. Hence, financing and delivering health care facilities in India is majorly catered by the private sector for more than 70% of diseases in both rural and urban areas.

Direct cost items (expenditure on medicines, diagnostic expenses, transportation cost, hospitalisation and consultation fee) and indirect cost items (loss of wage, spendings on health class and travelling expenditure) were most commonly reported costing expenses. This cost constitutes 50 % of the total direct costs. A primary cause for such abnormal costs of medicines is the common practice adopted by physicians to prescribe brand-named medicines, rather than generic medicines and high cost of investigations .

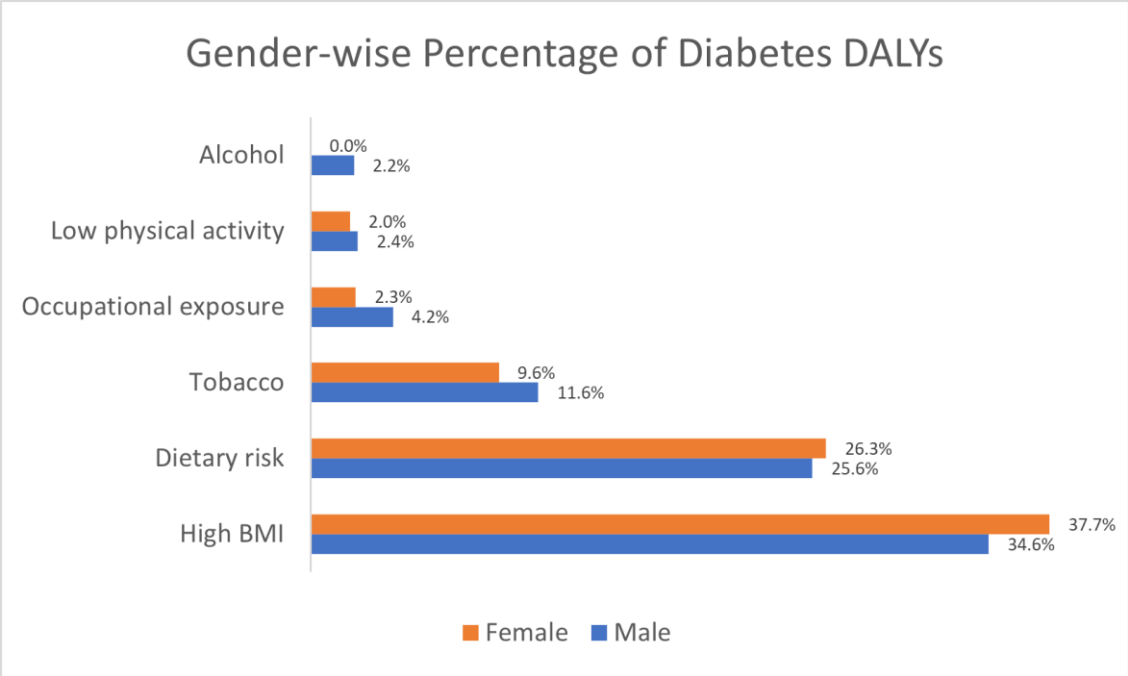
In India, the median average annual direct and indirect costs associated with diabetes care were estimated at □ 25,391 and □ 4,970, respectively. The cost of diabetes therapy increases linearly along with the duration of the disease.[6] The average life-time cost of all drugs used in diabetes management is estimated at □ 19,45,135.[6] The average total expenditure per patient per month (pppm) was □ 1,265, out of which medical expenditure was □ 993 and nonmedical expenditure was □ 271.[6] The total COI for diabetic care without any complications was □ 22,456 per patient per annum and with complication was □ 30,634.

The direct costs are related to the medical and non-medical cost of people with diabetes, mostly the burden on individual and at the family level. The indirect costs are related to the society and government, which are associated to loss of productivity.

Productivity loss arose from a combination of premature death, diabetes-associated labour force dropouts, absenteeism, and presenteeism over the past three decades, the burden of diabetes in terms of deaths and Disability-adjusted life year (DALYs) has more than doubled in India. As per the Global Burden of Disease (GBD) Data Visualizations, the recorded death rate and DALY rate of diabetes in

2019 were 19.64 per 100,000 and 919.02 per 100,000 population, respectively, including males and females. The GBD explore risk assessment framework estimated that diabetes-related DALYs attributable to high risk for Stroke, Coronary artery disease, Chronic Obstructive pulmonary disease, Chronic kidney disease, Diarrhoeal diseases, lower respiratory tract infections, dietary iron deficiency and neonatal disorders .

According to a survey conducted in 2016, the High Body Mass Index appeared to be the major risk factor contributing to 36% of diabetes DALYs. Besides, other risk factors, such as dietary risk, tobacco consumption, occupational exposure to passive smoke, low physical activity, and alcohol consumption, played a significant role as contributing risk factors.[1]




**Diabetes Prevention**

The main concerns with the management of diabetes are that many Indians do not have access to free health care or health insurance. They are also not able to continue to pay to access better diabetes management for themselves. This increases the risk of mortality and morbidity.

Hence Government Schemes to prevent diabetes is the best option as treatment of diabetes is very expensive.

**Indian Diabetes Prevention Program**

The Indian Diabetes Prevention Program is a three-year randomised control trial that employed Life style medicine and metformin to prevent type 2 diabetes in subjects with non- diabetic hyperglycaemia [pre-diabetes]. It concluded that Lifestyle medicine and Metformin were cost-effective interventions for preventing diabetes among high-risk individuals in India and other developing countries.

**National Diabetes Control Program]**

The National Diabetes Control Program was initiated in 1987 in some districts of Tamil Nadu, Jammu and Kashmir and Karnataka. Its objectives included:

- Identifying high-risk individuals
- Introducing health education for the purposes of early intervention
- Aiming for early diagnosis and treatment of affected individuals
- Reducing morbidity and mortality in high-risk groups
- Preventing acute and chronic metabolic, cardiovascular, renal and ocular complications due to the disease
- Rehabilitating people who have been handicapped due to the disease

However, the program was not expanded to other states due to shortage of funds.

**Conclusion**

Diabetes is an expensive illness to treat. It is also evident that the largest share of costs was being borne by patients and their families. Any efforts at cost reduction should, therefore, have the family as its focus, and relieving the family of this financial burden needs to be prioritised.

There government has to implement schemes for public education regarding healthy lifestyle and physical activity to prevent developing diabetes mellitus. To spread knowledge regarding the symptoms of diabetes and advice regarding having regular blood checks to ensure it is caught early.

The Government needs to consider a universal health scheme or a subsidised health scheme for patients with diabetes .It needs to consider ensuring patients have access to affordable medications. To educate patients regarding complications of diabetes mellitus. Having subsidised access to annual eye checks, foot checks, blood pressure, diabetes and cholesterol control.

It is essential that the Indian Government works urgently to implement a holistic programme for diabetes prevention and reduce diabetic expenditure burden in the community.

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