

## REVIEW OF LITERATURE ON NON-COMMUNICABLE DISEASES (NCDs)

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DOI: <http://doi.org/10.47211/idcij.2022.v09i03.002>**ABSTRACT**

Non-communicable diseases (NCD) are defined by The World Health Organization (WHO) as chronic conditions, usually of long duration, and caused by a combination of genetic, physiological, environmental, and behavioural factors. Literature review lays the foundation, as support for a new insight, to summarise and synthesise the arguments and ideas of others and provide a solid background for a research paper's investigation. It illuminates how knowledge has evolved within the field, highlighting what has already been done, what is generally accepted, what is emerging and what is the current state of thinking on the topic. There were several group differences among those who 'had been ever diagnosed' with pre-diabetes/diabetes versus those who had not, by age, employment status, health status, nutrition knowledge, blood pressure/ hypertension diagnosis, and diabetes-related health behaviours.

**KEY WORDS:** Communicable diseases, diseases, NCDs.

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Non-communicable diseases (NCD) are defined by The World Health Organization (WHO) as chronic conditions, usually of long duration, and caused by a combination of genetic, physiological, environmental, and behavioural factors. These diseases are not infectious and tend to have a more significant impact on lower to middle-income countries due to the influence of environmental and behavioural factors.

Non-communicable diseases (NCDs) kill 41 million people each year, equivalent to 71% of all deaths globally. Each year, more than 15 million people die from an NCD between the ages of 30 and 69 years; 85% of these "premature" deaths occur in low- and middle-income countries. 77% of all NCD deaths are in low- and middle-income countries. Cardiovascular diseases account for most NCD deaths, or 17.9 million people annually, followed by cancers (9.3 million), respiratory diseases (4.1 million), and diabetes (1.5 million). These four groups of diseases account for over 80% of all premature NCD deaths. Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from NCD. Detection, screening, and treatment of NCDs, as well as palliative care, are key components of the response to NCDs.

Chronic disease is a broad category that encompasses non-communicable diseases (NCDs), such as diabetes, osteoarthritis, heart disease, chronic obstructive pulmonary disease, cancer, and depression, as well as communicable diseases (CDs), such as acquired immunodeficiency syndrome (AIDS) and hepatitis. In the biomedical field, the diagnosis of (NCDs) can be categorised according to aetiology, pathophysiology, protracted clinical course, comorbidity, symptoms, complications and treatment. However, they all involve an expected long duration and absence of a definitive cure.

Cardiovascular diseases such as heart attacks & stroke, diabetes, chronic respiratory diseases such as asthma, and a wide range of cancers are the main types of NCDs that impact the world's population today. Around the globe, annually, over 41 million people die from NCDs, accounting for 71% of all deaths each year. Additionally, statistics reveal that 15 million people between the ages of 30 and 69 years die each year from NCDs, with 85% of these deaths deemed 'premature' occurring in low- and middle-income countries. This demonstrates the significant socio-economic influence over the development and progression of these diseases. In terms of which NCDs are most prevalent, cardiovascular diseases come out as the most common, with 17.9 million people dying annually of it. Cancer claims the second most significant proportion of lives (9.3 million), followed by respiratory diseases (4.1 million), and finally, diabetes (1.5 million). In total, these four groups of diseases account for over 80% of all NCD-related premature deaths.<sup>4</sup>

Recent estimates suggest that overweight and obesity is the fourth most common risk factor for NCDs in the Region, after high blood pressure, dietary risks and tobacco use. It is also the leading risk factor for disability, causing 7% of total years lived with disability, and obesity is linked to greater morbidity and mortality from COVID-19.

Out of 7843 records, 23 papers were included in this review (15 quantitative, 3 qualitative and 5 mixed-method studies). The findings showed that existing literature predominantly examined health system readiness from the supply-side perspective as embedded in the WHO's health system framework. However, at the primary healthcare level, these components are insufficiently prepared for NCDs. Among NCDs, higher levels of readiness were reported for diabetes mellitus and hypertension in comparison to CRDs (asthma, chronic obstructive pulmonary disease), CVDs and cancer. There has been a dearth of research on the demand-side perspective, which is an essential component of a health system and must be addressed in future researches.

The premature deaths due to NCD have a high socio-economic impact as the affected are most likely the main income earner in the household. Several studies have shown that households where at least one member has one or more NCDs face higher health care expenditure compared to those who were diagnosed with any other disease. NCDs require a longer period of care and the health delivery system needs to be geared up by procuring technologically advanced equipment to take care of the patients. The National Programme for Cancer, Diabetes,

Cardiovascular Diseases and Stroke (NPCDCS) launched in India in 2011 aimed to prevent and control NCDs by means of behavioural changes, communication, community participation, opportunistic screening of NCDs and provision of NCD services through public health facilities.

The COVID-19 pandemic has severely disrupted health systems, economies, and societies. In many countries, this has set-back efforts to protect people from non-communicable diseases (NCDs). These are also known as chronic diseases which tend to be of long duration and are the result of a combination of genetic, physiological, environmental, and behavioral factors. The main types of NCD are cardiovascular diseases (such as heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes. NCDs disproportionately affect people in low- and middle-income countries where more than three quarters of global NCD deaths occur. Modifiable behaviours, such as tobacco use, physical inactivity, unhealthy diet, and the harmful use of alcohol, all increase the risk of NCDs, and Metabolic risk factors contribute to four key metabolic changes that increase the risk of NCDs: raised blood pressure; overweight/ obesity; hyperglycaemia and hyperlipidemia.

In Western countries, life expectancy and thus the significance of non-communicable diseases (NCD) have increased. Nowadays, NCDs are the major reason for death, morbidity, loss of independence and spurt in public health cost. However, according to WHO 30–50% of cancers and 80% of heart diseases, strokes and T2DM could be prevented or delayed by lifestyle changes. Lifestyle changes comprise physical activity, healthy diet, avoidance of tobacco and harmful amounts of alcohol.

High levels of chronic diseases in India, such as diabetes and hypertension, helped stoke the brutal corona-virus waves that hit the world's second-most populous nation during the pandemics. The findings from one of the few large-scale studies of Covid-19 in India showed patients from the southern district of Madurai had a higher risk of dying than those in China, Europe, South Korea, and the U.S., even though 63% of those tested were asymptomatic. Chronic health conditions in the community may have played a role. For years India has faced an escalating non-communicable disease crisis as its middle-class expands and leads a more sedentary and affluent lifestyle. That makes them susceptible to ailments such as diabetes and heart disease that account for almost two-thirds of all deaths in the country. These existing conditions may have allowed the corona-virus to do more damage, boosting cases and fatalities and potentially fuelling the near collapse of India's health system.

According to the study report "India: Health of the Nation's States"- The India State-Level Disease Burden Initiative in 2017 by Indian Council of Medical Research (ICMR), it is estimated that the proportion of deaths due to Non-Communicable Diseases (NCDs) in India have increased from 37.9% in 1990 to 61.8% in 2016. The four major NCDs are cardiovascular diseases (CVDs), cancers, chronic respiratory diseases (CRDs) and diabetes which share four behavioural risk factors – unhealthy diet, lack of physical activity, and use of tobacco and alcohol.

Approximately 90% of premature deaths in low- and middle-income countries are due to NCDs. Individuals with NCDs are also more susceptible to severe illness or death from infection with the severe acute respiratory syndrome corona virus 2, which causes the corona virus disease (COVID-19), and older adults with NCDs have a particularly increased susceptibility to COVID-19. Insufficient nutrition and maternal metabolic status during pregnancy are causes of metabolic disorders and cardiovascular diseases during adulthood.

Based on the evidence to date, the prepared guidelines recommend that high-risk patients should be treated promptly and reliably, starting earlier, at lower BP levels, and that the BP target should be gradually decreased. Initiation of antihypertensive therapy is recommended when BP is  $\geq 140/90$  mmHg, even in the absence of cardiovascular disease or risk factors. For patients who do have existing cardiovascular disease or cardiovascular disease risk factors and/or comorbid conditions (e.g., diabetes mellitus or chronic kidney disease [CKD]), antihypertensive drug treatment should be initiated when systolic BP (SBP) is 130–139 mmHg to achieve a reliable antihypertensive effect. Thiazide and thiazide-like diuretics, angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs), and long-acting dihydropyridine type of calcium channel blockers (CCBs) are recommended as first-line agents. In addition, fixed-dose single pill combinations (SPCs) are recommended to reduce the number of tablets taken and improve adherence. Target BP during treatment is  $<140/90$  mmHg in all

patients without comorbidities, while reducing SBP to <130 mmHg is recommended in patients with known cardiovascular disease or those with high cardiovascular risk.

Survivors of natural disasters are at a high risk of cardiovascular disease. Behavioural risk factors, including modifiable diet, need to be identified. Thus far, the association between dairy intake and new-onset hypertension among these survivors is unknown. Therefore, we investigated this relationship. We conducted a longitudinal cohort study of 4475 survivors of the Great East Japan Earthquake in 2011 who participated in a 7-year follow-up survey. New-onset hypertension was assessed using annual health check-up data. Information on the frequency of dairy intake was obtained using a self-report questionnaire. The hazard ratio for developing hypertension according to the frequency of dairy intake was calculated using Cox proportional hazards regression models. The total number of person-years observed was 20,042, with a median follow-up of 5.4 years. During the observation period, 1554 individuals developed hypertension. The multivariable-adjusted hazard ratios of new-onset hypertension were significantly lower in those who consumed dairy products once per day (0.82, 95% confidence interval 0.71–0.94) and twice or more times per day (0.84, 95% confidence interval 0.71–0.99) than in non-consumers; the inverse linear trend was marginally significant ( $P = 0.083$ ). This association was not affected by lipid metabolism and was consistent across subgroups by sex, age, behavioural factors, cardio-metabolic factors, and housing type due to the disaster. A higher frequency of dairy intake was associated with a lower risk of new-onset hypertension in community-dwelling survivors of earthquakes and tsunamis. Dietary guidance involving dairy intake could reduce the risk of developing hypertension among these survivors.

Pulse wave velocity increased across groups. Aortic distensibility, distensibility coefficient, and compliance were greater in low than in the mid or high groups. Significant determinants of arterial stiffness were sex, age, adiposity, BP, and LDL (low-density lipoprotein) cholesterol. Pulse wave velocity and aortic compliance were significantly associated with TOD (systolic and diastolic cardiac function and urine albumin/creatinine ratio) after controlling for BP and higher arterial stiffness is associated with elevated BP and TOD in youth, emphasising the need for primary prevention of cardiovascular disease.

Obesity is a worldwide problem with increasing prevalence and incidence in both developed and developing countries. In older adults, excess weight is associated with a higher prevalence of cardiovascular disease, metabolic disease, several important cancers and numerous other medical conditions. Worldwide increase in longevity has shifted the age distribution towards elderly population. In India, the size of the elderly population (above age of 60 years) is growing fast. As the data suggest, the absolute number in India increased from 76 million in 2001 to 100 million in 2011 and continues to rise further.

People with obesity not only have increased risk of developing asthma, but they also tend to have more symptoms, more frequent and more severe episodes. They also have reduced

A healthy lifestyle for non-communicable diseases (NCD) is the same as vaccination is for communicable diseases and is indispensable. The rising incidence of NCDs across socio-economic groups is a medical issue that is a cause of concern for people and the state, especially since the expenditure burden of NCDs extends over a long time.<sup>2</sup>

Over 463 million adults or one in eleven adults were diagnosed with diabetes according to the Diabetes atlas released by International Diabetes Federation in 2019. This already alarmingly high number is expected to rise to 578 million by 2030. India is only second to China in terms of diabetes patients, with almost 77 million or almost 17 percent of total diagnosed with Diabetics.<sup>3</sup>

Studies have highlighted that early childhood exposure to high sugar foods resets the brain to crave for these and makes it difficult to wean off junk food. Intake of foods high in sugars is directly linked to obesity - both frank obesity and an increased deposition of fat in the abdomen. Obesity is the number one modifiable risk factor for diabetes. Junk foods are usually high in saturated fats and may contain Trans-fats. Both these types of fats increase the levels of triglycerides in the blood. High levels of triglycerides are directly linked to the risk of developing Diabetes. The bad fats present in junk foods also increase the risk of CVD's.

The likelihood of contracting non-communicable diseases has increased manifold in the last few years, especially with the urbanisation. It is important to focus on these diseases because overlooking the same could have grave

consequences,” The death rate related to NCDs accounts for 63 per cent of all deaths and the probability of death from NCDs between the ages of 30 to 70 is 23 per cent according to UNICEF.

Expectedly, South Asia is facing an epidemiological transition from communicable diseases to NCDs. The percentage of NCD-related deaths out of the total number of deaths in South Asian countries ranges from 44% to 84%. NCD-related premature death statistics in these countries share a similar trajectory. As a result, it is crucial to maintain the quality of care (QoC) in NCD services in South Asia. In this review the concept of QoC was adapted from WHO as “health care must be safe, effective, timely, efficient, equitable and people-centred” for achieving QoC in health care services.<sup>11</sup>

Individuals with obesity, and particularly those with predominant visceral adipose tissue (VAT) accumulation, are for example at significant risk of developing a more severe form of corona-virus disease 2019 (COVID-19). Several studies worldwide have described the higher risk of infection, intensive care unit stay, and death in people with obesity. Moreover, these subjects produce more respiratory droplets with a higher viral load, and the people with obesity are therefore more infectious than normal-weight subjects. Also, we have recently demonstrated in more than 1,000 subjects that SARS-Co-V2 – the virus that causes COVID-19 – infection-naïve individuals with visceral obesity had lower antibody development over time than individuals without visceral obesity. They reached a lower antibody peak and had a more significant drop in antibody levels at three months after dose 2 of mRNA vaccines (2). This warning effect in individuals with abdominal obesity must also support recent recommendations to offer “booster” vaccines to adults with high-risk medical conditions, including obesity and those with more prevalent abdominal obesity phenotype.

The EU announced an estimated 7% of health costs were being spent treating cases of obesity, which accounted for 10–13% of deaths in different parts of the Region. Projections made by the WHO state that by 2030, eight European countries (Austria, Czech Republic, England, Estonia, Greece, Ireland, Slovenia, and Spain) will see the prevalence of frank obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) exceed 30% of the population. This will lead to an increased incidence of obesity-related disorders, and no national welfare system is equipped economically to support the related increase in expenditures. This is the picture we are looking at in the short-term, if action is not taken.

Growing evidence suggests that healthcare provider advice may reduce alcohol use, increase physical activity, and improve the adoption of other desirable lifestyle behaviours among patients. However, how brief interventions and other provider–patient interactions can shape the cumulative adoption of multiple modifiable behaviours is less well studied for diabetes prevention and control. Using weighted Internet panel survey data from a large socio-demographically diverse urban population in the United States ( $n = 1003$ ), the present study describes differences in group characteristics among those who ‘had been ever diagnosed’ with pre-diabetes/ diabetes versus those who had not. It also examines the associations between the cumulative adoption of lifestyle behaviours and each of the following: (a) lifetime pre-diabetes/ diabetes diagnosis; (b) brief lifestyle intervention exposure (i.e., ever received provider encouragement to modify lifestyle behaviours); and (c) recent provider–patient communication about diabetes. There were several group differences among those who ‘had been ever diagnosed’ with pre-diabetes/diabetes versus those who had not, by age, employment status, health status, nutrition knowledge, blood pressure/ hypertension diagnosis, and diabetes-related health behaviours ( $p < 0.05$ ). Each of the three provider–patient interactions of interest were positively associated with a higher cumulative sum of adopted modifiable lifestyle behaviours for diabetes prevention and management. The results suggest that provider advice/ provider–patient interactions of any type can have a salutary impact on whether individuals with pre-diabetes or type 2 diabetes will engage in recommended lifestyle behaviour modifications.

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