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Non-Communicable Diseases: Risk Factors, Management and Prevention Strategies

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Abstract
Non-communicable diseases (NCDs) are a group of pathological diseases that are primarily caused by poor lifestyle behaviours. Currently, non-communicable diseases (NCDs) are the world's leading cause of disability and death. According to data from the World Health Organization, chronic non-communicable diseases (NCDs) like diabetes, cancer, obesity, and respiratory conditions are responsible for about half of the global disease burden and about 60% of the 56.5 million deaths that occur each year. The main risk factors for non-communicable diseases (NCDs) include age, sedentary and inactive lifestyle, alcohol and tobacco use, obesity, and poor and unhealthy food choices. One of the controllable aspects impacting the onset of non-communicable diseases is lifestyle. Several online browsers and data collection tools, such as Research Gate, Krishikosh, and Academia were used to search articles. Primary prevention and surveillance, health promotion, management and health care are the three fundamental pillars of the prevention strategy. Thus, it is crucial to start initiatives to educate the public about the need to lead a healthy lifestyle to maintain good health and lower the prevalence of NCDs. Non-communicable diseases can be prevented or reversed with a wholesome diet, regular exercise, nutritional supplements, and adequate sleep duration and quality. Numerous studies have focused on the relationship between the prevalence of non-communicable diseases and the consumption of specific foods

Keywords: Non-communicable diseases, lifestyle disorders, Chronic diseases, obesity, risk factors, prevention and diabetes

Highlights

- Polyethylene mulch significantly improved growth and flower yield of *Crossandra infundibuliformis*.
- Mulching enhanced soil moisture conservation and reduced weed density.
- Polyethylene mulch produced the highest net returns and benefit–cost ratio.
- Organic mulches also improved crop performance compared to the control.

1. Introduction

Long-lasting and slowly progressing medical conditions are referred to as non-communicable diseases (NCDs) or chronic diseases. Many factors, including genetic, physiological, behavioural and environmental factors, contribute to most non-communicable diseases (NCDs) (1). However, the highest growth is expected to occur in highly populated areas of low- and middle-income classes. NCDs are the most common causes of death in most countries in the Americas, the Eastern Mediterranean, Europe, South-East Asia, and the Western Pacific, except in Africa. NCDs account for approximately 80% of deaths in low- and middle-income countries. By 2030, communicable, maternal, perinatal, and nutritional diseases are expected to surpass NCDs as the most common causes of death in African countries (2).

NCDs, which include obesity, diabetes, cardiovascular disease, chronic respiratory diseases and some types of cancer, are a global concern and account for over 71% of all deaths worldwide (3). A diet high in saturated fat and poor in fresh fruit and vegetables, sedentary lifestyles, tobacco use and excessive alcohol use are among the few behavioural risk factors that these diseases have in common. Due to rising urbanization and the growing internationalization of the food, tobacco and alcohol sectors, these risk factors are more common in countries with low or middle incomes and are typically concentrated in metropolitan areas (4). Among other NCDs, obesity, stroke, stress and atherosclerosis are caused by shifting lifestyle patterns (5).

A healthy diet, regular exercise, nutritional supplements and enough sleep duration and quality can all help prevent and/or reverse non-communicable diseases. Numerous researchers have investigated the link between the incidence of specific NCDs and the consumption of particular foods. Nowadays, food preferences have changed significantly from the past due to the growth of the social economy and the rise in living standards. Chinese physicians are at a higher risk of getting chronic diseases because of their occupation, which makes them more likely to lead an unhealthy lifestyle that includes unhealthy eating habits (6). The underlying mechanism controlling the start and course of the majority of diseases has also been identified as alterations in the mevalonate pathway and hormone balance (7,8). Another misconception is that it is a collection of diseases that exclusively affect the elderly. From childhood to adulthood, the risk factors for NCDs build up and become apparent after decades of exposure. The components are interconnected and create a series of events that begin with sociocultural elements that impact behaviour, like economic status and surroundings and end with the emergence of biological risk factors that result in non-communicable diseases. It is common for the biological risk factors to group together. For instance, obesity is linked to hypertension, insulin resistance, and hyperlipidaemia, all of which are factors in the development of diabetes and cardiovascular disease. Furthermore, one of the consequences of untreated diabetes is cardiovascular disease (9).

The focus of nutrition research has shifted in recent decades from examining the impacts of individual foods and nutrients to examining dietary patterns, presuming that combinations of foods and nutrients can have antagonistic or synergistic effects beyond those of individual components (10). In this regard, a number of dietary patterns have been linked to positive health outcomes (11). For instance, the Mediterranean diet, also known as the MedDiet, is the traditional food and lifestyle of people from Mediterranean nations and may help reduce chronic diseases and sudden death (12,13,14). According to the 2015–2020 Dietary Guidelines for Americans, MedDiet is one of the healthiest eating patterns that should be followed (15,16).

2. Materials and Methods

For this scoping review, a search for original or reviewed works was conducted until 2024 using the electronic databases Scopus, PubMed, Krishikosh, Research Gate and Google Scholar. “Non-communicable diseases”, “lifestyle disorders”, “chronic diseases”, “obesity”, “risk factors”, “prevention” and “diabetes” were the search terms used. The authors carefully selected and reviewed each of the references that were provided.

3. Results and Discussions

The World Health Organization’s statistics show that chronic non-communicable diseases (NCDs), such as diabetes, cancer, obesity, and respiratory diseases, account for approximately 60% of the 56.5 million

deaths that occur annually and almost half of the disease burden worldwide.

3.1 Different types of Non-communicable Diseases

3.1.1 Cardiovascular Diseases

Hypertension (high blood pressure), coronary heart disease (heart attack), cerebrovascular disease (stroke), peripheral vascular disease, heart failure, rheumatic heart disease, congenital heart disease, and cardiomyopathies are all types of heart and blood vessel disorders that are known as cardiovascular disorders (CVD). Among non-communicable diseases, these CVDs are the most contributing (17). It is estimated that these diseases, especially heart attacks and strokes, claim the lives of 17 million people year worldwide. Risk factors for CVDs include alcohol consumption, smoking, physical inactivity, and poor diet. Unfortunately, the increase in life expectancy in emerging nations is impacted by the harm caused by these risk factors (18,19).

3.1.2 Diabetes

Diabetes is a serious public health issue that is becoming epidemic in scope on a global scale. Chronic non-communicable diseases are becoming more and more common around the world at a startling rate. Diabetes and hypertension are two of the main risk factors for cardiovascular disease, which claims the lives of almost 18 million people annually. Currently, 312 million adults worldwide are obese, while over 1.7 billion are overweight. Furthermore, at least 155 million children are overweight or obese globally (20). Type 2 diabetes is becoming more common at earlier ages, including some obese and overweight children before puberty, and a large portion of this increase in diabetes will occur in developing nations. People in the middle, productive years of their lives, between the ages of 35 and 64, are most commonly impacted in developing nations. At BMI levels that are typically regarded as acceptable for white individuals in North America and Europe, the chances of type 2 diabetes mellitus tend to rise significantly in Asian nations. Prevalence estimates of obesity worldwide, which are now at around 250 million, would be significantly impacted by proposals to adopt particular classifications of obesity in Asians (e.g., BMI 23 for overweight and 25 or 27 kg/m2 for obesity) (21).

3.1.3 Cancer

One of the leading causes of death worldwide is cancer. Only cardiovascular diseases typically surpass it in the industrialized world, but the global increase results from developing nations. In 2000, there were more than 7 million cancer-related deaths and over 10 million new cases worldwide (22). While the incidence of stomach cancer typically decreases with economic development, the incidence of lung, colon and rectal, breast, and prostate cancers typically rises in parallel (23).

3.1.4 Chronic Respiratory Diseases

Globally, chronic respiratory diseases (CRDs) and non-communicable diseases (NCDs) are the leading causes of death and morbidity. Viegi et al. (2020) (24) reported that 495,000 people died from asthma, while 3.2 million people died from chronic obstructive pulmonary disease (COPD). The seventh most common cause of years of life lost (YLLs) was COPD. 545 million CRDs were reported overall, with roughly 50% of those cases being related to COPD and 50% to asthma. There were 62 million CRD incident cases, primarily from COPD (29%) and asthma (69%). While smoking, particulate matter pollution, ambient ozone pollution, occupational exposure to particulate matter, gases, and fumes, as well as second-hand smoke, are significant risk factors for COPD, smoking and a high body mass index are relevant risk factors for asthma. According to YLL forecasts, aging and population expansion will result in an increase in the number of NCDs by 2040, with COPD predicted to become the fourth most common cause.

3.1.5 Abdominal Obesity (AO)

Excess fat accumulation in the abdomen area can be referred to as abdominal obesity. It has a positive correlation with non-communicable diseases (NCDs) and is a prevalent health problem among South Asians (25). An increase in waist circumference has been seen between 1960 and 2000, particularly among women. Even among those with normal BMIs, AO has experienced a greater change than overall obesity due to a higher risk of NCDs (26). Adipose tissues that cover the posterior part of the abdominal wall and link to the intestine make up mesenteric fat, which is created by the peritoneum folding twice. It is made up of a network of blood arteries that ensure a steady flow of fatty acid and lipid molecules and permit the accumulation of fat in the abdominal area (27). Studies show that a high-calorie diet and sedentary lifestyle increase the amount of lipogenic activity in mesenteric fat tissues compared to subcutaneous fat and other body parts. Compared to other parts of the body, this one has a very active metabolism and may constantly absorb fat. Increased circulation of free fatty acids due to excess fat deposition causes atherogenesis, hyperlipidaemia, hypertension, and cardiovascular diseases. Additionally, high blood levels of free fatty acids may promote hepatic lipid production, leading to insulin resistance (28).

3.2 Risk Factors of Non-Communicable Diseases

Prospective cohort studies and randomized trials have demonstrated the detrimental effects of dietary and behavioural risk factors on noncommunicable diseases, as well as the metabolic and physiological conditions that mediate these effects. These findings, along with data from risk-factor surveillance, have been used to determine the mortality and disease burden attributable to risk factors, both globally and by region and country.

3.2.1 Physical Inactivity

The failure to meet the necessary amounts of physical activity for health is referred to as physical inactivity. Around the world, a large number of people do not engage in the recommended minimum of 30 minutes of regular, moderate-intensity physical activity on average of their daily lives (29). Nowadays, physical inactivity is referred to as a pandemic that requires immediate attention (30). One out of every four adults worldwide is sedentary, according to research. The percentage of adolescents who are not physically active is over 80% worldwide. People who are physically sedentary are 20–30% more likely to die than those who are active, according to research. Global efforts are currently underway to reduce the prevalence of physical inactivity by 10% by the end of 2025 (31). The greatest strategy to enhance physical activity is to exercise, while there are other ways (32). Physical inactivity interventions must be planned in order to prevent and manage NCDs. Exercise is important for treating noncommunicable diseases (33,34). It has been shown to improve cognitive, emotional, social and psychosocial functioning as well as physiological functioning.

3.2.2 Diet

Eating a diet high in sodium, trans fats, red or processed meat and sugar-sweetened beverages, while deficient in whole grains, nuts, seeds, fruit, vegetables, fibre, legumes, omega-3 fatty acids, PUFA, milk and calcium indicate dietary risk. Consuming a sufficient amount of fruits and vegetables each day is linked to lower risks of cardiovascular diseases, stroke, type 2 diabetes and several forms of cancer, which are the leading causes of mortality and morbidity. Trans fatty acid intake raises the risk of coronary heart disease by 28% and death from any cause by 34%. Adults should consume less than 5 g of salt per day, which is equivalent to 2 g of sodium per day, according to WHO recommendations. Consuming too much salt is associated with negative health effects, including an elevated risk of hypertension, which can result in heart disease and stroke. Epidemiologic research that highlighted the connection between Sugar-sweetened beverages (SSB)consumption and long-term weight gain, type 2 diabetes mellitus and CVD risk has revealed that SSBs play a role in the obesity pandemic (35).

3.2.3 Tobacco Use

Tobacco use is a major public health issue, and both smoking and smokeless tobacco use are widespread. One in six deaths from non-communicable diseases (NCDs) is attributable to tobacco use, a significant modifiable risk factor shared by diabetes, cancer, cardiovascular disease and chronic respiratory conditions. Each year, tobacco smoking—both direct tobacco use and second-hand smoke—causes the deaths of about 6 million people. According to data from multiple studies, tobacco users are 12 times more likely to have lung cancer, 1.5 times more likely to have a stroke, 1.4 times more likely to have chronic obstructive pulmonary disease (COPD) and 2-3 times more likely to develop coronary heart disease (CHD). The risks are age-gradient, with younger age groups having a higher relative risk (5–6 times), and they are comparable for men and women. They also rapidly decline after quitting smoking (36).

3.2.4 Alcohol Consumption

Eight distinct malignancies are directly related to alcohol (to varying degrees), and the risk rises with the amount of alcohol consumed. Alcohol consumption is also correlated with many cardiovascular consequences, such as atrial fibrillation, haemorrhagic stroke and hypertension. The association is more complicated for other cardiovascular events. Additionally, alcohol is associated with pancreatitis and many liver diseases, including fatty liver, alcoholic hepatitis and cirrhosis. The relationship is complicated for diabetes as well. According to conservative estimates, alcohol use accounts for 3.4%, 5.0% and 2.4% of the worldwide NCD-related burden of fatalities, net years of life lost (YLL), and net disability adjusted life years (DALYs), respectively. The burden is highest for liver cirrhosis and cancer (37). Lowand middle-income countries' health systems are facing challenges due to the rising prevalence of underlying risk factors and the growing burden of non-communicable diseases (NCDs). Three age groups—under 35 (young), 35–59 (middle-aged) and 60 years and older (elderly)—were examined for age effects. As people age, the prevalence of certain biological risk factors (hypertension, hyperlipidaemia) and behavioural risk factors for NCDs—such as smoking, drinking, and a sedentary lifestyle—increases. Men and women 60 years of age and older had the highest prevalence of the majority of behavioural risk factors. For both sexes, the middle-aged had the highest prevalence of diabetes and overweight/obesity, whereas the

elderly had the highest prevalence of hypertension and hyperlipidaemia (38).

3.2.5 Excess weight and obesity

A rising public health concern is obesity. In 2016, 650 million adults were obese and over 1·9 billion adults were overweight, much exceeding the number of people who had normal weight. Obesity is linked to a higher risk of many major non-communicable diseases, including as type 2 diabetes, coronary heart disease, stroke, asthma and many malignancies, in addition to lowering life expectancy and quality of life. Early research revealed that metabolically healthy obesity is linked to a negligible increase in disease risk, particularly when paired with high activity (39).

3.3 Management and Prevention of Non-Communicable Diseases

The necessity to prioritise NCD prevention and control should be emphasised in light of the projected burden of NCDs and our current healthcare system. The goal of our efforts should be to track the prevalence of NCDs and the risk factors associated with them. Certain NCDs share risk factors that should be addressed for the least resources while producing the greatest possible results. The three main pillars of the approach are management and health care, health promotion and primary prevention and surveillance (40). To establish economic, political and environmental conditions that prevent NCDs and their associated risks, as well as to empower individuals to act both individually and collectively to prevent risky behaviour, health promotion policies that prioritize disease prevention are required. It is necessary to maintain updates on risk trends and assess the anticipated results of intervention tactics. The incidence of NCDs and the effectiveness of interventions are influenced by several factors, including the needs of developing nations, gender and income disparity, growing population ageing and prolonged poverty. The government started emphasising lifestyle and behaviour modifications, decades ago to expand the reach of national health policies beyond conventional medical and surgical procedures, given the impact of unhealthy lifestyles on the chronic disease pandemic (41). To lower premature mortality and morbidity from NCDs, the WHO Department of Noncommunicable Diseases is in charge of providing technical assistance, leadership, coordination and direction on a worldwide scale. The WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020 was extended to 2030 by the World Health Assembly in 2019. To speed up the process of preventing and regulating NCDs, it recommended the creation of an Implementation Roadmap 2023–2030. Actions to accomplish a set of nine global targets with a major effect on NCD management and prevention are supported by the Implementation Roadmap. The United Nations 2030 Agenda for Sustainable Development acknowledges non-communicable diseases as a significant worldwide concern. By 2030, the Agenda aims to cut the number of premature deaths from NCDs by one-third. WHO is a major leader in coordinating and advancing the worldwide effort to combat NCDs (1).

4. Conclusion

The largest cause of death globally is non-communicable diseases, which are mostly brought on by poor lifestyle choices. The majority of risk factors linked to NCDs include diets deficient in whole grains, cereals, fruits and vegetables, nuts, legumes, MUFA, PUFA, a sedentary lifestyle, excessive alcohol and tobacco use and obesity. Potential preventive measures for managing NCDs include lifestyle modifications and controlling the major risk factors for the disease. To reduce the prevalence rate of NCDs, both governmental and individual efforts are needed.

5. Authors Contribution

All authors wrote, reviewed and approved this manuscript for publication.

6. Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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