

Preventive Healthcare Services for Non Communicable Diseases

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Abstract: *Human Immunodeficiency Virus (HIV) infection continues to be one of the most serious public health challenges worldwide. HIV attacks the immune system, especially CD4+ T lymphocytes, leading to gradual weakening of immune defenses. If untreated, HIV progresses to Acquired Immunodeficiency Syndrome (AIDS), making the body vulnerable to opportunistic infections and cancers.*

Keywords: Human Immunodeficiency Virus

I. INTRODUCTION

Non-communicable diseases (NCDs) are chronic diseases that are not transmitted from person to person and usually progress slowly over a long duration. Major NCDs include cardiovascular diseases, diabetes mellitus, hypertension, cancer, chronic respiratory diseases, obesity, osteoporosis, and mental health disorders. According to the World Health Organization, NCDs are responsible for nearly 74% of deaths globally.

The increasing prevalence of NCDs has become a major public health challenge worldwide, especially in developing countries like India. Urbanization, unhealthy dietary habits, tobacco consumption, alcohol intake, physical inactivity, stress, and sedentary lifestyles are the major risk factors contributing to the rise of these diseases.

Preventive healthcare services play an essential role in reducing the burden of NCDs. Prevention focuses on reducing risk factors before the disease develops and promoting healthy lifestyles among individuals and com Preventive healthcare services include health education, regular screening programs, vaccination, nutritional counseling, lifestyle modification, physical activity promotion, smoking cessation programs, early diagnosis, and regular health monitoring.

The healthcare system is now shifting from disease treatment to disease prevention because prevention is more economical, effective, and beneficial for long-term health outcomes. Various national and international organizations promote preventive healthcare strategies for reducing morbidity and mortality associated with NCDs. Physical activity, balanced nutrition, stress management, regular exercise, and behavioral changes are considered the foundation of preventive healthcare.

Healthcare professionals, including pharmacists, play an important role in preventive healthcare by counseling patients regarding medication adherence, healthy lifestyle practices, diet management, smoking cessation, and disease awareness. Community pharmacists are easily accessible healthcare providers who can educate the public about prevention and early detection of NCDs.

Thus, preventive healthcare services are essential for controlling the growing burden of NCDs and improving the quality of life of the population.

Non-Communicable Diseases (NCDs) are chronic diseases that are not transmitted from one person to another. These diseases are of long duration and generally progress slowly. Major NCDs include cardiovascular diseases, diabetes mellitus, cancer, chronic respiratory diseases, obesity, hypertension, and mental health disorders. NCDs are now considered one of the

In Türkiye, the prevalence of ischemic heart disease and diabetes mellitus has increased over the years . The preventive health services are most effective when accessed regularly and proactively. Despite their proven benefits and availability, the utilization of preventive health services remains suboptimal in many settings. This paradox highlights the importance of understanding not just the availability of services but also the factors that influence whether individuals access them. The existing literature highlights various barriers and facilitators influencing access to and



utilization of preventive health services in Türkiye . However, many studies rely on quantitative data, which may not fully capture the complex, lived experiences of both healthcare providers and individuals who could benefit from these services. A qualitative approach allows for a deeper exploration of personal attitudes, perceptions, and contextual factors.

Non communicable disease

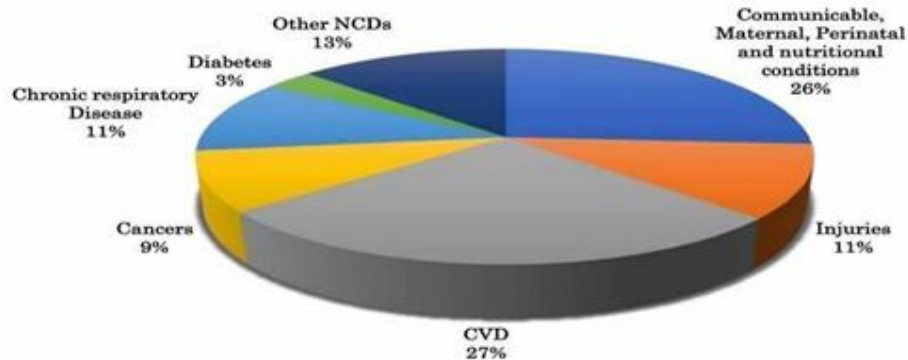


Fig 1 – NCDs and proportional mortality in India

As per the WHO – NCD India profile - 2022, NCDs are estimated to account for 66% of all deaths in country of which the cardiovascular diseases lead with 28% overall mortality cause followed by chronic respiratory diseases (12%), cancers (10%), diabetes (4%) and others (12%) (Figure 1)5As per the recently published Indian Council of Medical Research–India Diabetes (ICMR- INDIAB) study, the national prevalence of hypertension is 35.5%, generalized obesity is 28.6%, abdominal obesity is 39.5% and dyslipidemia is 81.2 %6 As per India State-Level Disease Burden Initiative CVD Collaborators- 2016, there were 54.5 million cases of cardiovascular diseases, 23.8 million cases of ischemic heart diseases, 6.5 million cases of stroke, 55 million cases of COPD, 38 million cases of asthma and 65 million cases of diabetes7In 2016, cardiovascular diseases were responsible for 28.1 percent deaths, while chronic respiratory diseases contributed to 10.9% deaths and cancers contributed to 8.3

Table.1-National health programmes for NCDs

S N	Preventive area	Targets		
		Outcome in National Plan	2020	2025
1	Premature mortality from NCDs	Relative reduction in overall mortality from CVDs, cancer, diabetes or chronic respiratory diseases	10%	25%
2	Obesity and diabetes prevalence	Halt in rise in obesity and diabetes prevalence	No midterm target set	Halt in rise in obesity and diabetes prevalence
3	Physical inactivity	Relative reduction in prevalence of insufficient physical activity	5%	10%
4	Raised blood pressure	Relative reduction in the prevalence of raised blood pressure	10%	25%

Table.2 - Government of India 10 Targets for NCDs Prevention and Control



Objective

To understand the concept and burden of non-communicable diseases.

1. To study the major risk factors associated with NCDs.
2. To evaluate various preventive healthcare services used in the prevention and control of NCDs.
3. To study the importance of lifestyle modification in preventing chronic diseases.
4. To analyze the role of healthcare professionals, especially pharmacists, in preventive healthcare services.
5. To create awareness regarding early diagnosis and regular health screening for NCDs.
6. To study national and global strategies for prevention and management of non-communicable diseases.
7. To study the role of primary healthcare and community healthcare in NCD prevention.
8. To analyze lifestyle modification measures such as healthy diet, physical activity, smoking cessation, and stress management.
9. To study the importance of early diagnosis, screening, and health education in NCD prevention.
10. To understand the role of pharmacists and healthcare professionals in preventive healthcare services.
11. To create awareness regarding the management and prevention of chronic diseases among the population.
12. To understand the concept and types of Non-Communicable Diseases.
13. To study the major risk factors responsible for NCDs.
14. To evaluate preventive healthcare services for the control of NCDs.
15. To study the importance of health promotion and lifestyle modification in preventing chronic diseases.
16. To understand the role of screening and early diagnosis in NCD management.
17. To study the role of healthcare professionals and pharmacists in preventive healthcare services.
18. To analyze government healthcare programs related to prevention and control of NCDs.

Literature and Review

1. Kamil Ondar et.al (2020)

Non-communicable diseases (NCDs) such as heart disease, cancer, diabetes, and respiratory disorders are major causes of death worldwide. The main risk factors include unhealthy diet, physical inactivity, smoking, alcohol use, obesity, and pollution. The study emphasizes that most NCDs can be prevented through healthy lifestyle changes, proper nutrition, regular exercise, awareness programs, and strong healthcare policies.

2. Sameer Dhingra et.al (2020)

This thesis explains that Non-Communicable Diseases (NCDs) like diabetes, cancer, cardiovascular diseases, and respiratory disorders are increasing rapidly, especially in low- and middle-income countries. The study highlights that Primary Health Care (PHC) plays an important role in preventing, detecting, and managing these diseases through health education, early diagnosis, community participation, and affordable healthcare services. Strengthening PHC systems can improve health equity, reduce deaths, lower healthcare costs, and improve the quality of life of people suffering from chronic diseases.

3. Azhar Effendi et.al (2023)

Non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases are major causes of death worldwide. The thesis explains that unhealthy diet, lack of physical activity, tobacco use, and alcohol consumption are the main risk factors for NCDs. It highlights the role of public health interventions like health education, tobacco and sugar taxes, smoking bans, community fitness programs, healthy food access, and early disease screening in preventing and controlling NCDs. Community-based and healthcare interventions were found effective in improving healthy behaviors and reducing disease burden. The study concludes that strong government policies, community participation, healthcare support, and guidance from organizations like the World Health Organization are essential for reducing NCDs and improving global public health.



4. Sukran Peker et.al (2025)

This study examined the utilization of preventive health services for non-communicable diseases (NCDs) such as diabetes, hypertension, cardiovascular diseases, and cancer in Istanbul, Türkiye. A qualitative phenomenological approach was used, involving interviews

Plan of Work

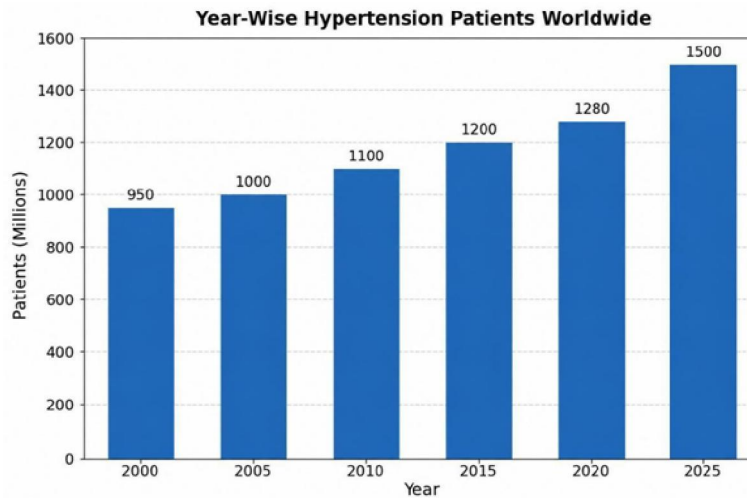


Fig.3 – year-wise hypertension patients worldwide

Year	Estimated Number of Hypertension Patients	Remarks
2000	972 million	Rapid increase due to lifestyle changes
2005	1000 million	Urban population affected more
2010	1100 million	Increased obesity and stress
2015	1200 million	Sedentary lifestyle became common
2020	1280 million	Major global public health problem
2025*	1500 million (estimated)	Expected rise due to aging population

Table No.3 - year-wise hypertension patients worldwide

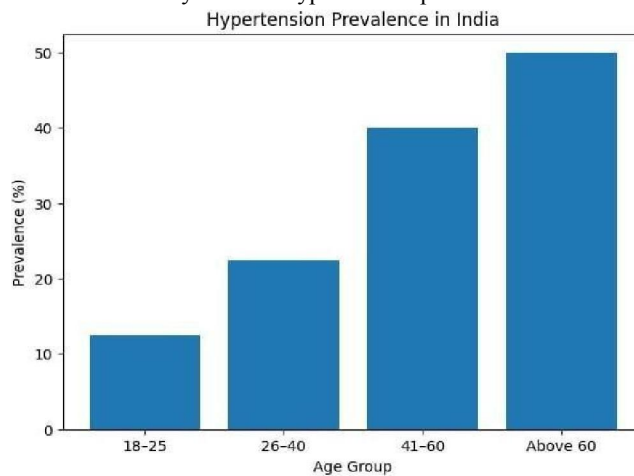


Fig.4 – hypertension prevalence in India



Age Group Approximate Prevalence

18–25 years 10–15%

26–40 years 20–25%

41–60 years 35–45%

Above 60 years 50% or more

1. Hypertension

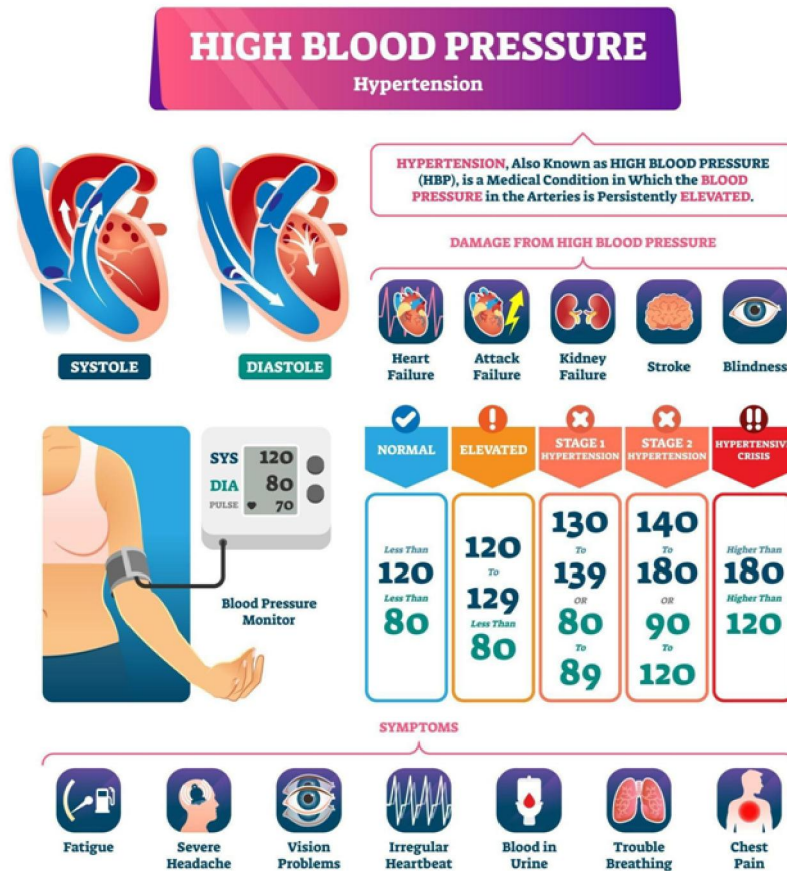


Fig.5 Hypertension working

Methods of Non-Pharmacological Treatment

1. Dietary Modification

- Reduce salt intake
- Eat fruits, vegetables, and whole grains
- Avoid oily and processed foods

2. Regular Physical Exercise

- Walking, jogging, cycling, yoga, or swimming
- At least 30 minutes daily

3. Weight Reduction

- Maintain healthy body weight



- Obesity increases blood pressure risk
- 4. Stress Management
 - Meditation and yoga
 - Proper sleep and relaxation techniques
- 5. Stop Smoking
 - Smoking damages blood vessels and raises blood pressure
- 6. Limit Alcohol Intake
 - Excess alcohol increases hypertension risk
- 7. Healthy Lifestyle Habits
 - Adequate sleep
 - Drink enough water
 - Avoid excessive caffeine
- 8. Regular Blood Pressure Monitoring
 - Routine BP checkups help early detection and control

Benefits

Cancer

According to the World Health Organization, cancer develops when normal cells undergo genetic changes that cause them to grow uncontrollably, invade surrounding tissues, and sometimes spread to distant parts of the body (metastasis).

Cancer is a disease in which abnormal body cells grow uncontrollably and may spread to other parts of the body. This spread is called metastasis.

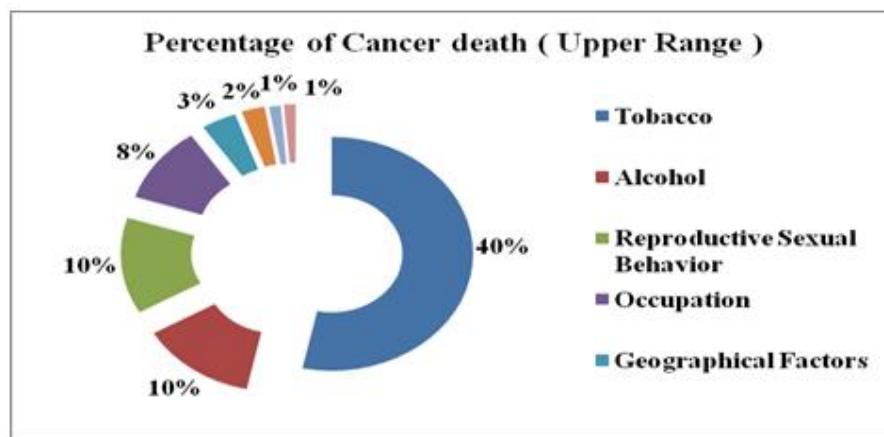


Fig. 7 percentage of cancer death

Global Situation

The WHO Predicted that by 2040, “29–30 million cancer cases may be there globally. Lower-middle income country will have highest increases in the cases. Out of the 15 million deaths between the ages of 30 and 69 (premature deaths) in 2018, 4.5 million were due to cancer. In 80% of countries, trends in premature mortality from cancer are inhibiting progress toward achieving SDG target 3.4. Scaling-up cancer control to achieve UHC is essential to improve outcomes and save lives in all countries” [13].

Globally, cancer is second leading cause of health. The global situation of incident, mortality and death causing cancers has been depicted in Figures 7.



Type of Cancer	Description	Examples
Carcinoma	Begins in epithelial cells that line the skin and internal organs. It is the most common type of cancer.	Breast, Lung, Colon, Prostate, Skin Cancer
Sarcoma	Develops in connective and supportive tissues such as bone, cartilage, fat, muscle, and blood vessels.	Osteosarcoma, Liposarcoma
Leukemia	Cancer of the blood-forming tissues, especially the bone marrow, resulting in abnormal white blood cells.	Acute Lymphoblastic Leukemia (ALL), Acute Myeloid Leukemia (AML)
Lymphoma	Originates in the lymphatic system, which is part of the immune system.	Hodgkin Lymphoma, Non-Hodgkin Lymphoma
Myeloma	Cancer that develops in plasma cells, a type of white blood cell found in bone marrow.	Multiple Myeloma
Melanoma	Arises from melanocytes, the pigment-producing cells of the skin.	Malignant Melanoma
Brain and Spinal Cord Tumors	Develop in tissues of the central nervous system.	Glioma, Meningioma

Table.4 Types of cancer

1. Carcinoma

Carcinoma is the most common type of cancer. It originates in epithelial cells, which are the cells that cover the outer surface of the body and line internal organs, glands, and body cavities. Carcinomas can develop in many organs, including the skin, lungs, breast, prostate, colon, and stomach.

Carcinoma occurs when genetic mutations cause epithelial cells to grow and divide uncontrollably. These abnormal cells may form a malignant tumor, invade nearby tissues, and spread to other parts of the body through the blood or lymphatic system (metastasis).

Types of Carcinoma

- Adenocarcinoma – Develops in glandular tissues and organs such as the breast, colon, prostate, and lungs.
- Squamous Cell Carcinoma – Arises from squamous epithelial cells found in the skin, mouth, esophagus, and cervix.
- Basal Cell Carcinoma – A common skin cancer that begins in the basal cells of the epidermis.
- Transitional Cell Carcinoma – Occurs in the urinary system, particularly the bladder and ureters.

Risk Factors

- Tobacco use
- Excessive alcohol consumption
- Exposure to ultraviolet (UV) radiation
- Environmental pollutants and chemicals
- Viral infections such as HPV
- Family history of cancer

Symptoms

Symptoms vary depending on the affected organ but may include:

- Unusual lumps or swelling
- Persistent cough



- Changes in skin appearance
- Difficulty swallowing
- Unexplained weight loss
- Abnormal bleeding

Treatment

Treatment options include:

- Surgery
- Chemotherapy
- Radiation therapy
- Targeted therapy
- Immunotherapy

Signs and Symptoms

The symptoms of leukemia occur because abnormal white blood cells interfere with normal blood cell production.

Common symptoms include:

- Persistent fever
- Frequent infections
- Fatigue and weakness
- Pale skin due to anemia
- Easy bruising and bleeding
- Nosebleeds
- Bone and joint pain
- Swollen lymph nodes
- Enlarged liver or spleen

The severity of symptoms varies depending on the type and stage of leukemia.

Pathophysiology of Leukemia

Leukemia begins when genetic mutations occur in the DNA of blood-forming cells within the bone marrow. These mutations cause the cells to grow and divide uncontrollably.

Normal bone marrow produces:

- Red blood cells (carry oxygen)
- White blood cells (fight infection)
- Platelet
- Abnormal white blood cells multiply excessively.
- Healthy blood cells are crowded out.
- The body's ability to fight infection decreases.
- Oxygen transport becomes inadequate due to reduced red blood cells.
- Bleeding risk increases because of low platelet counts. As the disease progresses, leukemia cells may spread to the lymph nodes, liver, spleen, brain, and other organs.

Several risk factors have been identified:

- Genetic mutations
- Family history of tumors
- Exposure to ionizing radiation



- Environmental toxins and chemicals
- Weak immune system
- Increasing age
- Smoking and unhealthy lifestyle habits

Although mobile phone radiation has been studied extensively, there is still no conclusive evidence that it directly causes brain tumors.

Common symptoms include:

- Persistent headaches
- Nausea and vomiting
- Seizures
- Blurred or double vision
- Difficulty in speaking
- Weakness or numbness in limbs
- Loss of balance and coordination
- Memory problems
- Personality or behavioral changes
- Back pain and difficulty walking (in spinal cord tumors)

Diagnosis

Early diagnosis is important for proper treatment and improved survival. Diagnostic methods include:

1. Neurological examination
2. Computed Tomography (CT scan)
3. Magnetic Resonance Imaging (MRI)
4. Biopsy
5. Lumbar puncture in selected cases

Treatment

Treatment depends on the tumor type, location, and severity. Common treatment methods are:

Surgery

Surgical removal is often the first treatment option to remove as much of the tumor as possible

Radiation Therapy

High-energy radiation is used to destroy tumor cells.

Chemotherapy

Anticancer drugs are administered to kill cancer cells or stop their growth.

Targeted Therapy

Specific drugs target abnormal molecules present in tumor cells.

Rehabilitation Therapy

Physical therapy, speech therapy, and occupational therapy help patients recover neurological functions.

Prevention

There is no guaranteed method to prevent brain and spinal cord tumors, but certain measures may reduce risk:

- Avoid unnecessary exposure to radiation
- Maintain a healthy lifestyle
- Avoid smoking and alcohol abuse
- Consume a balanced diet rich in fruits and vegetables
- Regular medical checkups



Impact on Public Health

Brain and spinal cord tumors contribute significantly to the global burden of non-communicable diseases. They can lead to disability, psychological stress, financial burden, and reduced productivity. Long-term treatment and rehabilitation are often expensive and may affect both patients and families emotionally and socially. Brain and spinal cord tumors are serious non-communicable diseases affecting the central nervous system.

Radiation Therapy

Use of high-energy rays to kill cancer cells

Immunotherapy

Boosts body's immune system to fight cancer

Targeted Therapy

Targets specific cancer cells with fewer effects on normal cells

Prevention

- Avoid tobacco and alcohol
- Healthy diet and exercise
- Regular screening tests
- Vaccination (HPV, Hepatitis B)
- Protect from harmful radiation

Complications

- Spread to other organs
- Severe pain
- Organ failure
- Weak immune system

Diabetes

Diabetes mellitus is a chronic non-communicable disease (NCD) in which the body cannot properly regulate blood glucose (sugar) levels. This happens when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces.

Diabetes mellitus is a chronic disease in which the blood sugar (glucose) level becomes high due to insufficient insulin production or improper use of insulin by the body.

"Diabetes mellitus is a chronic non-communicable disease characterized by elevated blood glucose levels resulting from impaired insulin production, insulin action, or both. It is broadly classified into Type 1 diabetes mellitus, Type 2 diabetes mellitus, gestational diabetes mellitus, monogenic diabetes, and secondary diabetes. Each type differs in its etiology, pathophysiology, clinical presentation, and management strategies, making accurate diagnosis essential for effective treatment and prevention of complications

Types of Diabetes Type 1 Diabetes

Type 1 diabetes mellitus is a chronic autoimmune disease in which the body's immune system attacks and destroys the insulin-producing beta cells of the pancreas. As a result, little or no insulin is produced, leading to elevated blood glucose levels. Type 1 diabetes commonly develops during childhood or adolescence, although it can occur at any age. Individuals with Type 1 diabetes require lifelong insulin therapy for survival.

Key Characteristics

- Autoimmune origin
- Absolute insulin deficiency
- Usually develops at a young age
- Requires lifelong insulin treatment



Type 2 Diabetes

Type 2 diabetes mellitus is the most common form of diabetes and occurs when the body's cells become resistant to insulin or when the pancreas cannot produce sufficient insulin to maintain normal blood glucose levels. It is strongly associated with obesity, physical inactivity, unhealthy dietary habits, and genetic predisposition. Type 2 diabetes is often preventable through healthy lifestyle choices and can be managed with diet, exercise, medication, and sometimes insulin therapy.

Treatment

Non-Pharmacological Treatment

- Healthy diet
- Regular exercise
- Weight management
- Stress control

Pharmacological Treatment

- Insulin therapy
- Oral antidiabetic drugs such as:
 - Metformin
 - Glimepiride

Complications

- Heart disease
- Kidney damage
- Eye problems
- Nerve damage
- Foot ulcers

Prevention

- Balanced diet
- Regular exercise
- Maintain healthy weight
- Avoid smoking and alcohol

Mental Health Disorders

Mental health disorders are a group of conditions that affect a person's thoughts, emotions, behavior, and overall psychological well-being. These disorders are classified as non-

Anxiety

Anxiety is one of the most common mental health disorders and is recognized as an important non-communicable disease (NCD). It is characterized by excessive fear, worry, nervousness, and apprehension that persist over time and interfere with daily activities. While occasional anxiety is a normal response to stress, anxiety disorders involve intense and prolonged symptoms that can significantly affect an individual's physical, emotional, social, and occupational functioning.

Anxiety disorders affect people of all ages and are among the leading causes of disability worldwide. They often occur alongside other chronic non-communicable diseases such as diabetes, cardiovascular disease, cancer, and chronic respiratory disorders, contributing to a greater disease burden and reduced quality of life.



anxiety is a mental health condition characterized by persistent feelings of worry, fear, tension, or uneasiness that are disproportionate to the actual situation. Anxiety becomes a disorder when these feelings are excessive, difficult to control, and interfere with normal daily functioning.

Anxiety disorders are chronic conditions that may persist for months or years if left untreated.

Causes and Risk Factors

The development of anxiety disorders is influenced by multiple biological, psychological, and environmental factors.

Biological Factors

Family history of anxiety disorders

Imbalance of neurotransmitters in the brain
Hormonal changes

II. CONCLUSION

Non-Communicable Diseases (NCDs) such as hypertension, diabetes mellitus, cancer, and cardiovascular diseases have become major public health problems worldwide due to unhealthy lifestyle habits, physical inactivity, tobacco use, stress, obesity, and poor dietary practices. This project highlights that preventive healthcare services play a vital role in reducing the burden of NCDs through early diagnosis, regular screening, health education, lifestyle modification, and community awareness programs. Healthcare professionals, especially pharmacists and primary healthcare workers, contribute significantly by providing counseling, medication guidance, and promoting healthy behaviors. Effective prevention strategies such as balanced diet, regular exercise, smoking cessation, stress management, and routine health checkups can help reduce morbidity and mortality associated with chronic diseases. Therefore, strengthening preventive healthcare services, improving public awareness, and encouraging healthy lifestyles are essential for the effective prevention and control of Non-Communicable Diseases and for improving the overall quality of life.

Result

The present study concluded that Non-Communicable Diseases (NCDs) such as hypertension, diabetes mellitus, cardiovascular diseases, cancer, and chronic respiratory diseases are increasing rapidly due to unhealthy lifestyle practices, poor diet, physical inactivity, smoking, alcohol consumption, obesity, and stress. The study found that preventive healthcare services such as health education, regular screening, early diagnosis, lifestyle modification, and community awareness programs play an important role in reducing the burden of NCDs.

The review also showed that primary healthcare services, healthcare professionals, and pharmacists contribute significantly to prevention and management through patient counseling, medication guidance, and awareness activities. Both pharmacological and non-pharmacological treatments were found effective in controlling chronic diseases when combined with healthy lifestyle habits. Therefore, strengthening preventive healthcare systems and promoting healthy behavior can reduce morbidity, mortality, and complications associated with NCDs while improving the overall quality of life. Only 35% of the participants had good knowledge, followed by 40% with a moderate level of knowledge, on various aspects of cancer. People knew that tobacco and alcohol consumption were cancer-causing risk factors, which has been reported in the ICMR reports [3]. Most believed that avoiding alcohol and tobacco can reduce vulnerability. Awareness of common cancer symptoms are limited to all in the community, which is similar other states in the northeastern region in India [4]. One study in Assam found that 92% participants enjoyed chewing areca nuts, and only 18% tried to quit [5]. However, in our study, approximately 63% of the indigenous population had quit areca nut chewing owing to high levels of awareness in the community.

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