

DIET AND BEHAVIOUR AMONG PEOPLE WITH NONCOMMUNICABLE DISEASES: A PUBLIC HEALTH PERSPECTIVE

Abstract

From the standpoint of public health, this chapter examines the complex interaction that exists between behavior, nutrition, and noncommunicable diseases (NCDs). In order to guarantee a higher quality of life, the preamble highlights the significant influence of nutrition on NCDs, including diabetes, cardiovascular illnesses and cancer. It also highlights the necessity of early intervention. Alarming data on NCD-related mortality worldwide are shown in the epidemiological burden section, with an emphasis on diabetes, cancer, respiratory disorders, and cardiovascular diseases.

The chapter explores metabolic risk variables, emphasizing the role that obesity, hyperglycemia, hypertension and hyperlipidemia play in NCDs. It talks about the complex relationship that exists between high cholesterol, diabetes, and the development of diabetic neuropathy. Additionally, the impact of dietary choices and other lifestyle factors on cholesterol levels is investigated.

There is a discussion of how food consumption behavior affects non-communicable diseases (NCDs), with a focus on how changes in global dietary patterns affect the development of NCDs. The scientific evidence section sheds light on the connection between diet and non-communicable diseases (NCDs), supporting plant-based diets, increasing intake of fruits and vegetables and highlighting the dangers of processed and red meat.

The utilization of cutting-edge technology, heart-healthy meals and physical

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activity are all recommended as prevention and management measures in detail. In order to improve diets, the chapter ends with a discussion of basic relaxing techniques and an argument for population-based approaches to policy making. It highlights how urgent it is to address bad eating habits because they are a major global cause of mortality and disability and encourages cooperation across stakeholders in order to put evidence-based policy solutions into practice.

Keywords: Epidemiology, Public Health, Diet, Non-communicable Diseases, Prevention, Policy Interventions.

I. PREAMBLE

Our diet and nutritional status might have a high impact on diabetes, like intestinal cancer and cardiovascular diseases. Food consumption is linked to high blood pressure, high cholesterol and insulin resistance, as well as being overweight and obese. Furthermore, these conditions are important disease-causing variables as well as risk factors for NCDs. To avoid difficulties and ensure quality of life, one must adopt healthy behaviors and concentrate on routine intervention for NCD prevention at an earlier stage of life.

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II. EPIDEMIOLOGICAL BURDEN - DIET AND BEHAVIOURAL PATTERNS

Non-communicable diseases (NCDs) cause 41 million annual deaths, or 74% of all mortality worldwide, according to recent empirical findings. According to this statistic, 17 million individuals globally die from an NCD before they age 70 every year, with low- and middle-income countries accounting for 86% of these premature deaths. In other words, low- and middle-income countries account for 77% of deaths caused by NCDs.

The majority of NCD deaths, or 17.9 million people annually, are also brought on by cardiovascular diseases, followed by chronic respiratory diseases (4.1 million), cancer (9.3 million) and diabetes (2.0 million, including deaths from renal disease brought on by diabetes). These four disease types account for more than 80% of all premature NCD-related fatalities. Additionally, using tobacco products, leading a sedentary lifestyle, abusing alcohol and maintaining an unhealthy diet all raise the risk of dying from a non-communicable disease.

III. PEOPLE AT RISK

Numerous behaviors that can be changed, like smoking, being inactive, eating poorly and abusing alcohol, raise the risk of NCDs. More than 8 million individuals per year pass away from tobacco-related illnesses, including those brought on by passive smoking. Overconsumption of sodium and salt has been connected to 1.8 million annual fatalities. 830 000 people pass away annually as a result of inactivity.

IV. METABOLIC RISK FACTORS

Elevated blood pressure, which is responsible for 19% of all fatalities worldwide, is the main metabolic risk factor and is followed by obesity and high blood sugar levels. There are four major metabolic alterations that raise the risk of NCDs. Four key metabolic changes that increase the risk of NCDs.

1. Hypertension
2. Hyperglycaemia
3. Hyperlipidaemia
4. Obesity

V. LEARN ABOUT OUR BODY CHOLESTEROL

Elevated cholesterol is typically a result of poor lifestyle choices such as eating a high-fat diet, not exercising, smoking and drinking too much alcohol. These lifestyle decisions may have a negative impact on the condition of your heart.

These accumulations may restrict blood flow through your arteries, which may increase your risk for heart disease, strokes and chest pain. Pay attention to your legs because they may act as early indicators of high cholesterol.

- 1. Information on LDL:** Blood cholesterol is created by our liver and is required for the hormone synthesis process as well as the digestion of fatty foods. Although we have all the cholesterol we need in our bodies, we can also get it from diet, especially from animal products. Cholesterol travels through the blood on proteins called lipoproteins. These come in two varieties, with LDL (low-density lipoprotein), also referred to as "bad" cholesterol, being one of them. Three subclasses of low-density lipoproteins (LDL)—A, B and I—are recognized. According to current research, subclass B is a much better predictor of impending heart attacks than total LDL testing. Subclass B is significantly more dangerous.
- 2. Information on HDL:** High-density lipoprotein absorbs cholesterol and delivers it to the liver. The liver then eliminates it from the body. Your risk of heart disease and stroke can be decreased by having high levels of HDL, or "good" cholesterol. Several lifestyle changes will be discussed that you should make if your HDL level is too low. These may help you increase your HDL levels and prevent related diseases.
- 3. Diabetic Neuropathy with High Cholesterol:** The feet may become numb due to nerve loss brought on by diabetes. Along with excessive blood sugar, your cholesterol levels may contribute to diabetic nerve damage. The cells' ability to function can be affected by the interaction between blood sugar and high or low HDL levels. People might not notice foot wounds that could later develop into ulcers because of the absence of sensation in the feet associated with this disease.
- 4. Diseases and Unhealthy Cholesterol:** The levels of cholesterol could get higher if you're taking medications for other medical conditions like cancer, high blood pressure, irregular heartbeats, organ transplants, acne or high blood pressure.
- 5. Do cholesterol Levels Change when you sleep?**

According to a recent study, men who slept for less than six hours on the majority of nights had higher levels of LDL "bad" cholesterol. Nevertheless, women who slept the same amount had reduced LDL. They also found that both snorers had lower HDL "good" cholesterol levels.

- 6. High Levels of Triglycerides Coupled with Trans-fat:** Trans fats are produced when liquid oils are converted into solid fats like shortening or margarine by food makers. Trans fats are present in all fried, battered, "fast" packaged and processed foods. The bad (LDL) cholesterol rises while the beneficial (HDL) cholesterol falls as a result of Trans fat consumption. Trans fat consumption increases the risk of heart attack and stroke. Type-2 diabetes is additionally more likely to manifest as a result.

VI. FOOD CONSUMPTION BEHAVIOUR INFLUENCES NCDs

People all around the world are becoming exposed to foods and diets that affect the likelihood of getting NCDs increasingly frequently. Globally, calories from foods high in fiber, such as whole grains, pulses and roots, have declined while calories from meat, sweets, oils and fats have climbed significantly. In low- and middle-income countries, consumption of processed and convenient meals is fast rising. Dietary habits and nutrient intake are both impacted by this nutrition shift and both have an impact on the likelihood of developing NCDs.

Similar to overeating, under nutrition and its impacts on maturation, growth and development have a number of detrimental repercussions, including the ability to raise the risk of NCD development later in life.

VII. THE RESEARCH EVIDENCE ON THE RELATIONSHIP BETWEEN NUTRITION AND NCDs

- 1. Plant-Based Diets:** The risk of developing obesity, diabetes, cardiovascular disease and various malignancies is reduced by eating a plant-based diet. Vegetarian diets are heavy in fruits and vegetables, whole grains, legumes, nuts and seeds and low in dairy and meat. These diets lower blood pressure, help people reach and maintain a healthy weight and are rich in dietary fiber, which guards against colon cancer.
- 2. Fruits and Vegetables:** Fruits and vegetables lowers the risk of cardiovascular disease. Specific fruits and vegetables, such as cruciferous ones like cabbage and broccoli, as well as many others that are high in folate, are probably protective against malignancies of the mouth, pharynx, larynx and oesophagus.
- 3. Red and Processed Meat:** Red and processed meat consumption increases the risk of colon cancer. Blood cholesterol levels are raised by saturated and trans fats, which also elevate the risk of heart disease. A key risk factor for high blood pressure, cardiovascular disease and perhaps stomach cancer is consuming more sodium/salt. Consuming dairy products and meat elevates blood pressure. Diets rich in highly processed, energy-dense meals, refined carbohydrates and /or sugary drinks worsen obesity and overweight issues.
- 4. Obesity and its consequences Impact on Health:** The most significant health issue facing the globe today, according to the globe Health Organization, is obesity. Children and teenagers are also affected by this, in addition to adults. The primary factor in morbidity, disability, mortality and a decline in societal quality of life is obesity. Additionally, obesity is linked to a higher chance of dying from heart disease and some

types of cancer. Examples of therapies include dietary management, nutrition education, habit modification, increased physical activity, pharmaceutical management and surgical approaches. The foundation of treating obesity is creating a negative energy balance. Usually, dietary adjustments and increased energy expenditure are used to achieve this. The effectiveness of obese patients' weight loss depends on their participation in the creation of sufficient customized therapy programs.

VIII. PREVENTION AND CONTROL

Controlling NCDs involves putting a lot of effort into lowering the risk factors connected to these diseases. Contextual behavior change communication awareness materials can help governments and other stakeholders minimize common modifiable risk factors at a cheap cost.

High-impact key NCD interventions can be provided through a primary health care strategy to enhance early diagnosis and treatment of NCDs. According to the evidence, these interventions are great financial investments because they can delay the need for more expensive therapy when delivered to patients at an early stage. It is doubtful that nations with inadequate health care coverage will grant everyone access to life-saving NCD therapies. In order to achieve the Sustainable Development Goals (SDGs) objective for NCDs, interventions for NCD management are essential.

1. **The World Health Organization Package of Essential NCD :** The early detection and management of NCDs is made possible by the WHO PEN implementation tools, preventing potentially deadly consequences. The detection, screening and treatment of NCDs are all part of this management, as well as giving those who require it access to palliative care. The following two features of this program make it possible to practice adopting social behavior in order to reduce complications from NCDs.
2. **Engage in Regular Physical Activity:** At least 150 minutes of physical exercise per week, progressively increasing to moderate levels (such as brisk walking). By cutting back on high-calorie foods and upping physical exercise, you can maintain a healthy weight and prevent obesity.
3. **Consume a Heart-Healthy Diet:**
 - **Salt (sodium chloride):** Reduce the amount of salt you use when cooking, keep your intake to no more than 5 grammes (1 teaspoon) each day and stay away from fast food.
 - **Vegetables and fruits:** 5 servings (400-500 g) of fruits and vegetables each day (one serving is equal to one orange, one apple, one mango, one banana, or three tablespoons of cooked vegetables).
 - **Foods high in fat:** No more than two tablespoons of fatty meat, dairy fat and cooking oil should be consumed each day. Replace palm and coconut oil with olive, soy, corn, rapeseed, or safflower oil. Chicken (without the skin) can be used in substitute of other meats.

4. **The Effects of Emerging Technology on Physical Activity:** Since the industrial revolution, new technologies have emerged that have allowed humans to perform numerous daily jobs with less physical labor. The consequences on physical labor and human energy expenditure expanded to affect many facets of an increasing number of people's lives as new technology became more readily accessible.
5. **Focus on Mental Health and Behaviour Adaptation:** Lack of mental readiness can hinder lifestyle changes. For people with NCDs to adopt a behavior that would improve their health and wellbeing, they must be aware of six steps of mental preparation.
 - **Precontemplation:** Individuals aware of core problem but is unwilling to act.
 - **Contemplation:** Individuals is aware that a change is on the way.
 - **Action plan:** based on identified objectives
 - **Maintenance:** Most fail at maintenance. Peer networks support can assist individual by encouraging and supporting their commitment.
6. **Social Media Interventions:** Facebook and Twitter are just two examples of the social media sites that are increasingly being utilized to support and promote public health initiatives. Living a healthy life requires knowledge about the disease and associated behaviors, a healthy diet and regular physical activity. This can be achieved through promoting community health and maintaining healthy behaviors with the use of social media on a regular basis.

It is important to inform potential female targets about the advantages of eating fruits and vegetables. The general female population needs to be informed about nutrition. The most successful instructional methods may involve cooking, tasting and eating because education without accompanying skill development is likely to only have a limited impact on behavior.

IX. GENERAL RELAXATION TECHNIQUES

Relaxation exercises are therapeutic exercises created to assist individuals in lowering tension and anxiety. In addition to its psychological effects, stress can result in physiological reactions including an elevated heart rate, palpitations, excessive perspiration, shortness of breath and muscle strain. The main goals of relaxation techniques will be to improve sleep quality, posture and comfort while lowering anxiety and tension, discomfort and stiffness.

1. The Following Relaxation Techniques are used

- **Progressive muscle relaxation:** Using this technique, you gradually tense and then release each muscle group, starting with your toes and working your way up to your head.
- **Breathing:** To control your breathing, try to relax your upper body and breathe deeply from your stomach. When pain prevents deep breathing, this might be used in addition to it to aid in muscular relaxation. By bringing oxygen into the body and

lowering blood pressure and pulse rate, deep breathing also aids in the reduction of pain and anxiety.

- **Good posture:** It's important to increase one's awareness of their posture and develop techniques to constantly monitor and correct their alignment.
2. **Bed Side Exercises:** The most pervasive fallacy or misunderstanding regarding the exercises is the idea that you cannot effectively exercise while lying in bed. Despite the fact that these bed workouts won't result in significant calorie burn, they will have a significant positive impact on strength and tone. Exercise has many benefits beyond simply burning calories and getting some exercise after a stressful day as you take some well-earned time to unwind and relax should make you feel good about taking care of your body and mind.
- **Bridging:** Put your feet flat on the mattress while bending your knees. Using your legs and bottom to push evenly through both, lift your buttocks off the bed. Hold still with your pelvis level for 5 seconds. Ten times, slowly make your way back to your bed.
 - **Leg Raise Exercises:** The bottom of your foot should be on the bed while you bend one knee. Lift a few inches off the bed by extending your other leg straight. Hold for three seconds before lowering the leg gradually. Repeat.

While lying on both sides, the same methods can be utilized to concentrate on the side muscles of the legs.

- **Static Exercise:** Static workouts include bringing up the tension in the muscles while keeping the length constant. When completing an activity, joint motion must be minimized. This activity might aid in the control and reduction of generated friction in elderly adults.
- **Quadriceps Muscles:** Legs extended straight in front of you. Your knee should be pressed into the bed as you draw your foot closer to you. Hold for 5 seconds, then do it again. Do not forget to exercise both legs.
- **Gluteal Muscles:** Keep your legs straight in front of you. Your stomach and leg muscles should remain relaxed while your bottom muscles are contracted. Before repeating, hold for 5 to 10 seconds.

X. POPULATION-BASED APPROACHES -POLICY LEVEL CHANGES

Population-based approaches ought to play a significant role in campaigns to improve diets, given the significance of social and environmental factors in determining eating behaviors.

At the local, regional, state, national and international levels—for example, in companies, schools and communities—effective solutions can be developed and put into action. The most convincing evidence of effectiveness comes from a few particular strategies.

These strategies cover a variety of areas, such as the media and education to improve diet when they are sustained, targeted at particular foods, labeling nutrition information, economic incentives like subsidies for healthy food products and taxes on unhealthy food products, school and workplace strategies by introducing curricula, training teachers and local environment changes by regulating the home and workplace environments for accessing healthy food products and plant-based foods.

XI. CONCLUSION

A primary cause of death and disability worldwide is poor eating practices. The prevalence of NCDs, which are mostly brought on by poor diet quality, is increasing while infectious and malnutrition-related disorders are reducing in nearly every part of the world. One of the major policy concerns for the twenty-first century is to improve global food quality since these disturbing trends place significant burdens on both health and economic development.

Even though there are still some gaps in our knowledge about specific dietary priorities or the relative efficacy and cost-effectiveness of certain dietary policies, lobbying and the implementation of pertinent policy solutions cannot wait for complete data. The research points to a number of precise dietary goals as well as practical measures to achieve them.

Poor dietary habits are a leading cause of death and disability worldwide. Nearly every region of the world is going through an epidemiological transition in which diseases of malnutrition and infectious diseases are declining while NCDs, which are largely caused by poor diet quality, are on the rise. These alarming trends impose enormous burdens on both health and economic development and improving global dietary quality is one of the twenty-first century's top policy priorities.

Although there are still gaps in our understanding of certain dietary priorities or the comparative effectiveness and cost-effectiveness of various dietary policies, advocacy and implementation of relevant policy strategies cannot wait for perfect evidence. The evidence suggests several specific dietary targets, as well as effective policies to address them. Relevant stakeholders must work together to create, put into effect and assess policy initiatives in order to increase dietary quality. Governments and international economic and political institutions must take the initiative and take action to improve population eating patterns through media and education campaigns, research and monitoring, agricultural policy, food pricing and food and marketing regulation. This chapter concentrated on a particular set of research-based policy instruments for enhancing diet. It is now time to act on this evidence.