

Different Dietary Patterns and the Chronic Diseases

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Abstract. Numerous chronic illnesses continue to be a significant contributor to the myriad variables influencing people's health in the modern world. The effects of different chronic diseases fluctuate greatly depending on the food patterns followed. The objective of this article is to investigate the connection between dietary habits and chronic illnesses. Specifically, the Western diet raises the risk of obesity, atherosclerosis development, and heart disease and stroke, while the Mediterranean diet lowers the incidence of major cardiovascular events. When it comes to the nutritional management of people with type 2 diabetes, the low-GI and high-fiber diet pattern is quite beneficial. It offers a fresh resource for managing diabetes. The issue of obesity is growing more severe in China, and low-carb diets provide a fresh approach to combating the problem. This article addresses the necessity of selecting a diet that is appropriate for you as well as the role that dietary patterns have in preventing chronic diseases.

Keywords: Cardiovascular disease; diabetes; Mediterranean diet; obesity problems.

1. Introduction

One of the main risks to public health today is chronic illness. The WHO report "Facts of Chronic Diseases" states that chronic illnesses, which include diabetes, obesity, and cardiovascular disease, now account for approximately 74% of all deaths worldwide [1]. The socioeconomic and social health are facing a significant challenge. Chronic diseases can arise from a number of different causes. As a result of ongoing investigation and thorough research, eating patterns are now progressively recognized as a major risk factor for the development of chronic illnesses. Numerous chronic diseases have varying dietary patterns associated with them, and irrational eating patterns can both cause and exacerbate the negative effects of chronic diseases. The dietary habits and patterns of Chinese citizens have experienced profound transformations due to the swift growth of China's social economy, and the country's rates of overweight and obesity are on the rise. The most recent study predicts that among Chinese adults (≥ 18 years old), the combined prevalence of overweight and obesity will reach 65.3% by 2030 [2]. Being overweight or obese is one of the chronic diseases that is causal and has an impact on diabetes, other chronic diseases, and other cardiovascular diseases.

In addition to helping to prevent chronic diseases or play a significant role in their treatment, appropriate dietary patterns like the Mediterranean diet, high-fiber diet, low-GI diet, and low-carb diet can also somewhat improve people's quality of life. In order to provide a theoretical reference for the prevention of chronic diseases, this paper examines the relationship between multiple dietary patterns and different chronic diseases, combined with various research data and clinical case analysis. Previous studies have primarily examined the impact of a particular dietary pattern on a single chronic disease.

2. Cardiovascular Disease

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Previous studies have primarily examined the impact of a particular dietary pattern on a single chronic disease [3]. Patients with this disease have a great decline in physical condition, a serious decline in their quality of life, and their daily life will be greatly affected, and they need to pay attention to their diet and prepare medicines with them, causing a huge financial burden on families and individuals, and the pressure on medical resources is also one of the worst impacts. Cardiovascular disease risk can be raised by leading an unhealthy lifestyle, which includes smoking, obesity, poor eating habits, and insufficient exercise. According to one study, every additional unit of BMI was linked to a roughly 29% increase in the risk of atrial fibrillation, a 16% increase in the risk of sudden cardiac death, and a 5% increase in men and a 7% increase in women [4]. In Western nations like the United States, Europe, etc., the Western-style diet is the most common dietary pattern. High-fat, high-sugar, high-calorie foods—like many fried foods and refined foods—are staples of the Western diet. Consumption of salt is also rather high. In addition, a sizable amount is accounted for by the consumption of red meat. Fruit and vegetable consumption is lowest among them [5]. In addition, the Western diet's high fat and sugar content may raise oxidative stress and the inflammatory response, two possible pathways for the emergence of cardiovascular disorders. Overindulgence in trans and saturated fats can raise LDL (low-density lipoprotein) cholesterol, accelerate atherosclerosis development, and raise the risk of heart attacks and strokes [6].

Based on the customary eating habits of the nations bordering the Mediterranean, the Mediterranean diet is a healthful eating plan. Fundamentally, obtaining vitamins involves consuming a lot of fruits and vegetables, limiting red meat intake, eating low-sugar and moderate amounts of red wine, and using olive oil as the primary fat source (rich in monounsaturated fatty acids, which is good for cardiovascular health) and fish as the primary source of protein (rich in Ω -3 fatty acids, which is good for cardiovascular health) [7].

In comparison to the United States and several Nordic countries, the Mediterranean diet was positively associated with a lower incidence of coronary atherosclerotic heart disease in a 25-year follow-up of 12,763 middle-aged men from seven countries: Finland, the Netherlands, Italy, the former Yugoslavia, Greece, and Japan [8]. Researchers randomly assigned participants in a multicenter trial conducted in Spain who had a higher risk of cardiovascular disease but no cardiovascular disease at the time of enrollment to one of three diets: a control diet that included dietary fat reduction, a Mediterranean diet supplemented with extra virgin olive oil, or a Mediterranean diet supplemented with mixed nuts. Every three months, participants receive both individual and group instruction. Depending on the group assignment, they also receive free extra virgin olive oil, mixed nuts, or small non-food gifts. Analyzing the frequency of significant cardiovascular events, such as myocardial infarction, stroke, or cardiovascular death, was the goal. Following a median follow-up of 4.8 years, the trial was terminated based on the interim analysis's findings. 5.7% of the 7,447 participants, who ranged in age from 55 to 80, were female. Both Mediterranean diet groups exhibited good adherence to the intervention, as indicated by self-reported intake and biomarker analysis. A primary endpoint event occurred in 288 participants. Multivariate adjusted risk ratios were 0.70 (95% confidence interval [CI], 0.54 to 0.92) and 0.72 (95% CI, 0.54 to 0.96), respectively, compared with the control group (96 participants) in the Mediterranean diet group (83 events) and the Mediterranean nut diet group (109 participants). No diet-related adverse effects were reported. It was concluded that a Mediterranean diet supplemented with extra virgin olive oil or nuts reduced the incidence of major cardiovascular events in high-risk populations [9].

3. Diabetes

Diabetes mellitus is a chronic illness that raises blood sugar levels by causing a number of metabolic disorders brought on by insufficient insulin secretion or a poor response of cells to insulin. Type 1 and type 2 diabetes are the most common types of this autoimmune disease, which is brought on by the immune system attacking cells that make insulin. Extreme thirst, frequent urination, exhaustion, weight loss, and other symptoms are typical. Insulin resistance and inadequate insulin

secretion are the main causes of type 2 diabetes. The illness progresses slowly, and symptoms like persistent exhaustion, frequent urination, blurred vision, and sluggish wound healing are possible. Over 90% of all cases of diabetes are type 2, making it one of the most common forms of the disease.

Glucose is one of the main energy sources that the body converts into energy through metabolic processes. This process is regulated by insulin, which helps cells absorb glucose for use as fuel or storage as glycogen. Diabetes, however, may result from the body's inefficient use of glucose. Insulin resistance is one of the numerous causes of diabetes. Insulin production is nearly nonexistent in type 1 diabetes, but it is reduced in type 2 diabetes, which means that glucose cannot enter cells effectively. Diabetes's effects can have a major impact on the body's systems. Elevated blood sugar levels raise the risk of cardiovascular disease, retinopathy, neuropathy, and other conditions by damaging blood vessels, nerves, and organs. Hyperglycemia can harm the kidneys' microvessels and glomeruli, resulting in diabetic nephropathy, which can eventually lead to chronic renal failure. It can also cause complications like cardiovascular disease, high blood pressure, and issues like dental caries, oral diseases, skin infections, chronic inflammation, etc. Diabetes management is essential. The keys to managing diabetes are appropriate exercise, diet, and medication.

Low-GI and high-fiber foods Because fiber slows down the digestion and absorption of carbohydrates and prevents blood sugar from rising quickly, foods high in fiber can help control blood sugar levels. Glycemic index, or GI for short, is a measurement of how quickly and how much blood sugar is raised by carbohydrates in food. Foods are ranked using this index according to how quickly their blood sugar levels rise after consumption; white bread and glucose typically have a GI of 100, and other foods are rated in comparison to this standard.) enhances insulin utilization and increases the sensitivity of insulin receptors. When it comes to the dietary management of patients with type 2 diabetes, the low-GI and high-fiber diet pattern is very beneficial.

Eighty type 2 diabetic patients were included in the study; forty patients each were assigned to the experimental and control groups. The body mass index, age, and gender of the two groups were similar. The responsible nurse provided the control group with routine type 2 diabetes dietary care, individualized motor control plan development, and food guidance. On the other hand, a professional dietitian created a personalized diet plan and provided particular foods, including two different basic recipes, for the experimental group, which followed a high-fiber, low-glycemic index dietary intervention based on standard care. To ensure proper implementation of specific dietary patterns, clients must eat on time and record their food intake in a diet diary for monitoring and improvement. The goal was to see how a low-GI, high-dietary-fiber diet affected diabetics. The findings suggested that low-GI and high-fiber foods may enhance insulin receptor sensitivity and insulin utilization. Additionally, dietary fiber can help food absorb sugar more gradually by wrapping it around it. This balances blood sugar levels after meals, helping diabetic patients manage their condition [10].

4. Corpulent

BMI is a commonly used metric to assess a person's weight-to-height ratio. BMI is calculated by dividing your weight (in kilograms) by the square of your height (in meters). The formula for BMI is: $BMI = \text{Weight (kg)} / \text{Height (m)}^2$ Based on the calculated BMI values, people can generally be classified into the following different BMI ranges: less than 18.5: underweight, 18.5 - 24.9: normal weight range, 25.0 - 29.9: overweight, 30.0 and above: obese.

An imbalance between energy consumption (too little) and intake (too much) is the primary cause of obesity and overweight. While the consumption of foods and drinks high in fat and sugar is rising globally, physical activity is declining. In China, the prevalence of overweight and obesity in children and adolescents has reached 40% in some cities, and more than 50% of adults and 20% of school-age children are overweight or obese [2]. In China, the prevalence of overweight, obesity, and associated chronic illnesses has increased dramatically over the last 20 years (obesity increases the risk of many chronic diseases). Significant lifestyle changes have occurred as a result of the growth of the social economy and the ongoing improvement of people's living conditions, and the obesity issue is

becoming more and more of a concern. The World Health Organization (WHO) has urged nations to take decisive action to stop the rise in obesity rates since 2000, particularly among young people [11]. Although China has developed and put into practice a number of policies and strategies aimed at preventing and controlling obesity, the issue of obesity and its associated chronic diseases remains unresolved.

Low-carb diets encourage consuming less carbohydrates and more high-quality fats and protein. To decrease fat storage, it is advantageous to lower insulin levels, speed up the rate of fat oxidation, and let more fat in the body to contribute to energy production. A diet rich in protein can benefit from the thermal effect of food, which increases the body's use of oxidative energy. Additionally, consuming adequate protein will satisfy hunger, which is beneficial for maintaining muscle mass and controlling weight.

A randomized controlled trial with a follow-up of at least eight weeks was conducted to compare the effects of a low-carbohydrate diet (≤ 120 g carbohydrates/day) with a low-fat diet ($\leq 30\%$ fat energy/day) on body weight and the risk of atherosclerotic cardiovascular disease in overweight and obese patients. Efforts have been made to address obesity. According to the findings, each diet may be linked to notable weight loss and a lower chance of atherosclerotic cardiovascular disease (ASCVD) events. Low-carb diets, on the other hand, were linked to somewhat higher but still noticeable improvements in weight loss and ASCVD risk prediction in studies that lasted eight weeks to twenty-four months [12]. To some extent, it is implied that low-carbohydrate diets should be considered as an effective and safe intervention for weight management in overweight and obese patients in future evaluation of dietary guidelines.

5. Conclusion

Worldwide, chronic illnesses have long posed a serious threat to people's health. In the field of public health, efforts have been made to prevent and treat chronic illnesses. Dietary habits are crucial in preventing chronic illnesses. Promoting healthy eating habits may be crucial to halting the onset and spread of chronic illnesses in the general population. Research on various dietary patterns has demonstrated that the Mediterranean diet, high-fibre diet, low-GI diet, and low-carb diet all encourage better lives and lower the prevalence of chronic illnesses like diabetes, obesity, and cardiovascular disease. These dietary patterns place an emphasis on consuming fewer processed foods, sugars, and saturated fats, and increasing intakes of fruits, vegetables, whole grains, healthy fats, and high-quality protein. These nutrient-dense eating habits can lower blood sugar and lipid levels, lower inflammation, and lower the risk of developing chronic diseases. In addition, by making healthy food options more widely available and by promoting diet education to encourage better eating habits, policies and social interventions can also improve public health. Subsequent studies ought to concentrate on the long-term consequences and personal health results that arise from varying food habits over time. More large-scale clinical trials and long-term follow-up studies are needed to comprehensively evaluate the effectiveness of various dietary patterns in the prevention of chronic diseases and to individualize the selection of the most appropriate dietary pattern.

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