

## ROLE OF DIETARY FIBER & CARDIOVASCULAR DISEASES

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Cardiovascular diseases (CVDs) are among the non-communicable diseases (NCDs) and are primary cause of premature morbidity and mortality worldwide. According to WHO, 17.9 million people died of CVDs, representing leading cause of death globally.<sup>1</sup> Punjab statistics showed that 17.5% of the population had CVDs<sup>2</sup> CVDs refer to a class of diseases that involves the heart and blood vessels, including heart failure, hypertensive heart disease, ischemic heart disease (IHD), and several other vascular and cardiac problems. CVD nearly doubled from 271 million in 1990 to 523 million in 2019, and the number of CVD deaths steadily increased from 12.1 million in 1990, reaching 18.6 million in 2019.<sup>3</sup> Numerous variables, such as a sedentary lifestyle, obesity, hypertension, diabetes, excessive alcohol use, poor dietary choices (characterized by inadequate vegetable and fruit consumption), or psychological stress, could be responsible for the significant burden of CVDs.<sup>4</sup> One of the significant risk factors for CVD is poor diet, which is also associated with other CVD risk factors such as hypertension, diabetes mellitus (DM), metabolic syndrome and obesity. Therefore, promoting a healthy diet is important to reduce the risk of heart disease and death.<sup>5</sup> Although most people agree that a healthy diet should include mostly of plant-based foods such as fruits, vegetables, and whole grains, with only modest amounts of dairy products, moderate amounts of protein, and small proportion of foods and beverages high in fats and sugars. Unfortunately, very few cultures actually follow this recommendation.<sup>6</sup>

Dietary fiber is one of the major nutrients that reduce the risk of CVDs. These carbohydrate polymers are primarily found naturally in food demonstrated to have positive health effects. There are various categories into which dietary fiber can be divided, and each category has unique characteristics. These consist of prebiotics, resistant starches, and soluble and insoluble fibers. These can be found in different foods in different levels. Approximately half of all dietary fiber comes from cereals and about a third from fruit and vegetables. Fruits and vegetables provide cellulose, hemi-cellulose and pectin, legumes give hemi cellulose, pectin and resistant starches and grains provide mainly cellulose and hemi cellulose. Daily recommended intakes for healthy men and women are 21g and 17 g, respectively.<sup>7</sup> In order to meet the recommended intake, it is necessary to eat several portions of legumes, cereals, fruit and vegetables daily.<sup>7</sup> The American Heart Association (AHA) endorses a total dietary fiber intake of 25 to 30 g/d from foods, not supplements, to guarantee nutrient adequacy and maximize the cholesterol-lowering impact of a fat-modified diet.

Fiber has an effect on health through a variety of ways like improvements in colonic function, including shorter transit times, increased volume in stool, and colonic fermentation (producing SCFA; short chain fatty acids), Lower blood cholesterol and lower blood glucose.<sup>6</sup> There is ample evidence to support the positive effects of fiber on cholesterol. The primary source of generally reported lipid and glucose-lowering characteristics is soluble fibre  $\beta$ -glucans. The  $\beta$ -glucans in the small intestine decrease the amount of circulating cholesterol by increasing viscosity and reducing bile acid reabsorption. Naturally occurring in the grain husk, also known as "bran," of grass family plants,  $\beta$ -glucan is found in high amounts in barley and oats. The majority of the dietary fiber component in grains like oats and wheat is insoluble. Legumes like beans, peas, and lentils, fruits including apples, pears, nectarines, apricots, and various berries, and dietary supplements like psyllium and inulin fibers are other plant-based

ingredients that are likewise high in viscous soluble fiber and thus helps in lowering cholesterol levels in body.<sup>8,9</sup>

The correlation between dietary fiber intake and heart health is unquestionable. From a functional point of view, dietary fiber is described as assisting in lowering cholesterol, attenuating blood glucose responses and supporting laxation. Consuming a diet high in fiber-rich foods has been repeatedly proved to lower the risk factors related to cardiovascular illnesses. Because soluble fiber binds to cholesterol particles and encourages their elimination from the body, it helps lower LDL (bad) cholesterol levels. It is especially prevalent in fruits, vegetables, oats, and legumes. Furthermore, fiber promotes a healthier cardiovascular system by lowering inflammation, enhancing insulin sensitivity, and controlling blood pressure. As a result, emphasizing a diet high in fiber is crucial for maintaining digestive health as well as protecting the heart from a variety of cardiovascular diseases. To develop a customized nutrition plan that is suited to your unique requirements and medical conditions, it is advised that you speak with a certified dietitian.

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