

Cancer Risk and Mortality: A Comprehensive Analysis of Dietary Patterns

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Perspective

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ABOUT THE STUDY

Single foods and nutrient are not typically consumed in isolation. Because dietary nutrient are consumed in combination, synergistic effects between food and nutrient may create a metabolic milieu that prevents or promotes carcinogenesis. This section presents an overview of dietary patterns and associated with cancer risk and risk of cancer-related mortality as indicated by studies that examined adherence to science-based public health dietary recommendations such as the U.S. government Dietary Guidelines for American (DGAs) and Mediterranean and vegetarian dietary patterns. The DGAs and a Mediterranean Diet (Med Diet) pattern have corresponding index scores that are used to quantify adherence using a standardised approach.

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The DGAs are designed to promote good health and reduce the risk of chronic diseases including cancer. The guidelines are revised every five years to account for advances in scientific knowledge pertaining to diet and disease relationship. The Healthy Eating Index (HEI) is a scoring tool that measures adherence to a given set of DGAs; higher scores are indicative of greater adherence to the guidelines. A recent systematic review and meta-analysis of prospective cohort studies examining diet quality, using several metrics including the HEI and various health outcomes, found that individuals consuming the highest-quality diets compared to lowest-quality diets had a 16% reduction in cancer mortality or incidence.

Ecological studies suggest overall cancer risk is lower in Mediterranean countries versus northern Europe, the UK, and the U.S. Many have attributed this distinction to the customary foods consumed by people residing in the region. A Med Diet pattern is one in which vegetable and whole grains feature prominently, fresh fruit is a typical dessert, olive oil is the main fat source, animal-based protein intake is limited, and wine is consumed in moderation, with meals. Mechanistically, it is hypothesized that certain aspects of the Med Diet, including a healthy fatty acid ration and foods rich in antioxidant and anti-inflammatory nutrients, work synergistically to promote reduced systemic inflammation and down-regulation of pro-carcinogenic pathways. Several research groups have developed scoring indices to operationalize and assess adherence to a Med Diet pattern to relate to disease outcomes. The Alternate Mediterranean Diet (aMED) score is a Med Diet adherence score developed specifically for U.S. population. The aMED has nine components, with one point awarded for scoring higher than the median intake within a given population/cohort for whole grains, fruits, vegetables, nuts, fish, legumes, and monounsaturated versus saturated fat ratio; one point is awarded for consuming one alcoholic beverage daily. In the National Institutes of Health-American Association of Retired Persons (NIH-AARP) Diet and health observational cohort study, greater adherence to a Med Diet pattern was associated with decreased risk of cancer-related mortality in both men and women. Regarding site-specific cancers, greater adherence to a Med Diet, based on aMED, was associated with lower colorectal cancer risk in men in a combined analysis of the Nurses' Health study and health Professionals Follow-up study, and decreased risk of lung cancer on both men and women in the NIH-AARP cohort, with an even more profound risk reduction in current and former smokers. However, not all studies have shown a strong association between Med Diet adherence and decreased cancer risk and mortality. For example, in the French NutriNet-Sante cohort study, greater adherence to a Med Diet, based on the Medi-Lite score, was not associated with decreased risk of breast, colorectal, or prostate cancer. In the Multi-ethnic Cohort study, greater adherence to a Med Diet, based on aMED, was associated with lower colorectal cancer mortality among African American cancer survivors. An important issue with the literature examining associations between Med Diet adherence and cancer risk and mortality is the use of different scoring approaches to assess Med Diet adherence. However, in the European Prospective investigation into Cancer and Nutrient (EPIC) study, researchers investigated three different Med Diet scores (Mediterranean Diet Score [MDS]), relative Med Diet Score [rMED], and the Mediterranean Style Dietary Pattern Score [MSDPS]) and association with overall cancer mortality. Comparing the highest versus lower quartile for each score, higher Med Diet adherence was associated with significantly lower risk of cancer-related mortality irrespective of the scoring approach used.