

THE ROLE OF DIETARY FIBERS IN THE PREVENTION AND PROMOTION OF CANCER

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Abstract

Background: Cancer poses a significant health issue globally, with dietary and lifestyle choices playing a crucial role. Dietary fiber, which is present in plant-based foods such as fruits, vegetables, and whole grains, has been extensively researched for its potential protective benefits against cancer, especially colorectal cancer. Fiber may lower cancer risk by supporting healthy bowel function, decreasing the time it takes for food to pass through the intestines, and aiding in the removal of carcinogens. Moreover, the fermentation of fiber by gut microbiota generates short-chain fatty acids like butyrate, known for their anti-inflammatory and anti-cancer properties. Nevertheless, some research indicates that both the type and quantity of fiber can affect these outcomes in various ways, highlighting the intricate relationship between fiber consumption and cancer development.

AIM: This systematic review was conducted to evaluate the role of dietary fibers in the prevention and

Materials and methods: In this study, Data extraction were searched and analyzed with PRISMA flow chart. Total of six articles were included for the study based on the inclusion and exclusion criteria. A comprehensive literature search was conducted using major databases including Science Direct, Google Scholar, PubMed and Research Gate, to identify relevant studies published in English. Quality assessment was done using the RoB 2 second version of Cochrane's risk of bias tool.

Results: Studies indicate that a high intake of dietary fiber average of 10g per day is associated with a reduced risk of 26% colorectal, 8% breast, and 28% gastric cancers. Fiber promotes gut health by increasing stool bulk, reducing transit time, and producing beneficial short-chain fatty acids through fermentation. These effects lower carcinogen exposure and inflammation. However, in certain contexts such as excessive intake of specific fiber types or in individuals with pre-existing gut conditions such as irritable bowel syndrome, inflammatory bowel disease, small intestinal bacterial overgrowth, etc fiber may promote tumor growth, highlighting the importance of fiber type and balance in cancer prevention.

Conclusion: Dietary fiber plays a significant protective role against various cancers by supporting gut health and reducing carcinogenic processes. However, its effects depend on the type, amount, and individual health conditions, emphasizing the need for balanced fiber consumption for optimal cancer prevention.

INTRODUCTION

According to the World Health Organization, cancer will be the top cause of death globally, accounting for around 10 million deaths¹. With an expected 9.6 million deaths and 18.1 million new cases globally in 2018, cancer is a complicated disease that nevertheless poses a major danger to

public health¹. Despite improvements in medical care and early identification, the prevalence of cancer is still increasing, which emphasizes the significance of preventative measures². Dietary fibers are a group of carbohydrates present in plant foods that are indigestible by the human body¹. Dietary fibers, including soluble, insoluble,

and fermentable types, support digestion, weight control, blood sugar regulation, heart health, and gut microbiota¹. They play a dual role in cancer prevention and promotion¹. Research on the function of dietary fibers in promoting and preventing cancer is one exciting field. Dietary fiber has been linked to a lower risk of cancer and is essential for a healthy digestive tract. It can be found in plant based meals such fruits, vegetables, and whole grains¹. Numerous studies have demonstrated that high dietary fiber intake is linked to a lower risk of various cancers³. Dietary fiber intake was inversely associated with colorectal cancer risk, highlighting the potential protective effects of fiber rich diets². High fiber consumption was associated with reduced breast cancer risk in postmenopausal women³. Dietary fiber acts as a substrate for beneficial gut microbiota, promoting a healthy gut microbiome that can enhance immune function and protect against cancer⁴. Fiber fermentation produces SCFAs, such as butyrate, which have been shown to have anti-inflammatory and anti-carcinogenic properties⁵. High fiber intake has been linked to improved insulin sensitivity, which may reduce the risk of cancers associated with insulin resistance, such as type 2 diabetes-related cancers⁵.

Fiber promotes a healthy gut microbiota that can strengthen the immune system against cancer by acting as food for good gut microorganisms⁴. Short-chain fatty acids, which have anti-inflammatory and anti-carcinogenic qualities, are produced during the fermentation of prebiotic

MATERIALS AND METHODS:

A systemic review of experimental studies, clinical trials and observational studies was conducted to investigate the role of dietary fibers in the prevention and promotion of cancer, evaluating its benefits and risks.

SEARCH STRATEGY

This systemic review investigates the relationship between dietary fibers and cancer, examining its potential role in cancer prevention and promotion. A comprehensive literature search was conducted using major databases including Science Direct, Google Scholar, PubMed and Research Gate, to identify relevant studies published in English.

ELIGIBILITY CRITERIA

Inclusion criteria

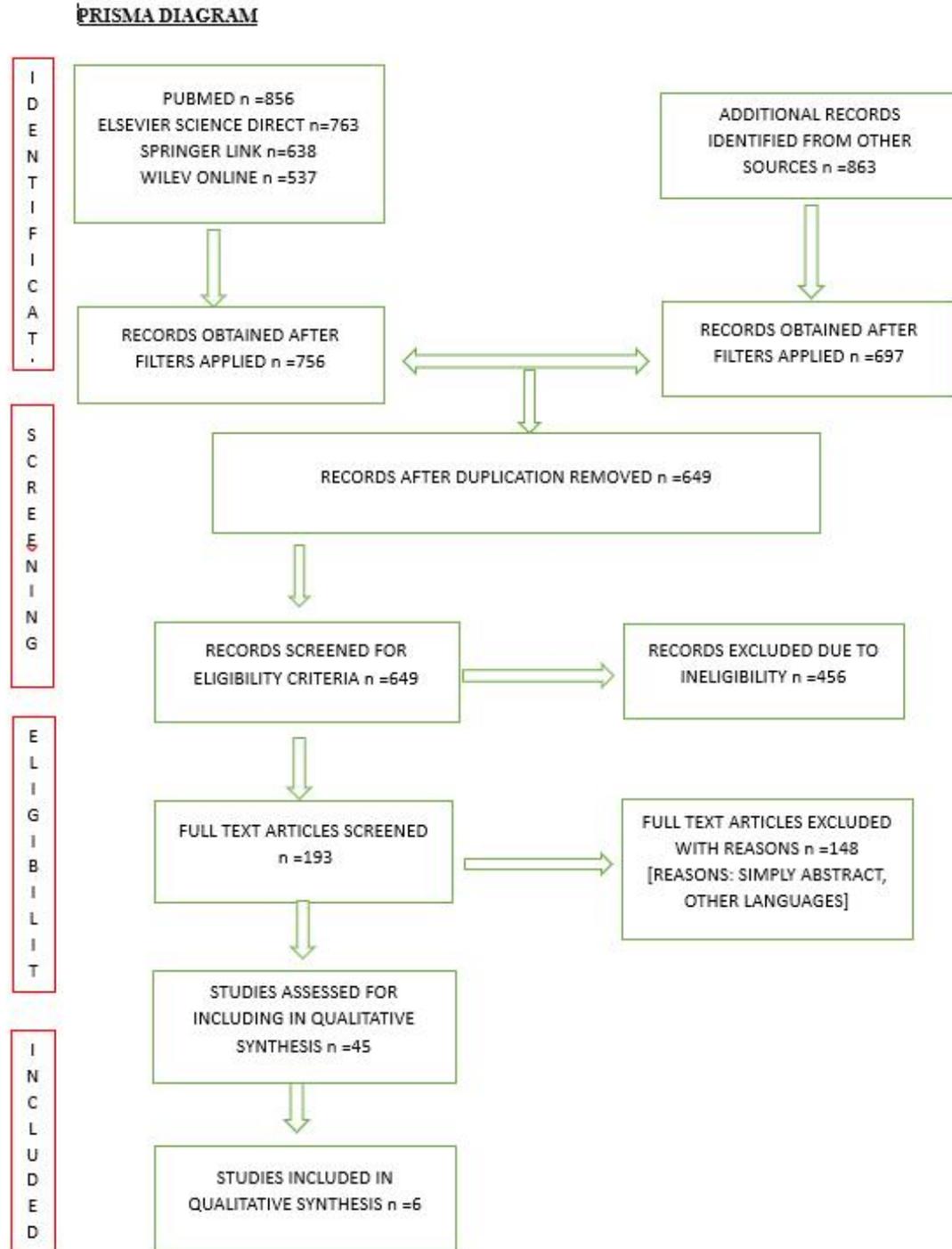
- ❖ This study includes clinical trials, animal studies and in vivo studies.
- ❖ Publication over the years (1996-2020).
- ❖ It consists of full length text articles from web engine such as Pub Med, Science Direct, Google Scholar and Research Gate.

fiber⁶. Those who consumed the most dietary fiber were 22% less likely to get colorectal cancer than those who consumed the least⁷. Butyrate can decrease inflammation in the colonic environment, stop cell division, and cause colorectal cancer cells to undergo apoptosis. Butyrate's anti-inflammatory qualities are especially important because chronic inflammation is known to be a risk factor for the development of cancer⁸. Low dietary fiber consumption, on the other hand, has been connected to a higher risk of developing several cancers⁹. Low dietary fiber consumption was linked to a significant increase in cancer risk, according to a case-control study of 1,957 patients with colon cancer¹⁰. Dietary fibers might encourage the development of advantageous gut microbiota, which results in the synthesis of anti-inflammatory chemicals¹¹. This systematic review aims to determine and establish that the intake of dietary fibers has dual role in the prevention and promotion of the cancer. The objective of this review is to investigate the relationship between the dietary fiber intake and cancer risks by examining the Epidemiological evidence linking dietary fiber consumption to the risk of various types of cancer. To elucidate the mechanisms by which dietary fiber exerts its anticancer effects by exploring the potential mechanisms including prebiotic effects, short chain fatty acid production and modulation of the gut microbiome. To examine the potential benefits and limitations of dietary fiber in cancer prevention.

Exclusion criteria

- ❖ Articles published other than English.
- ❖ Only abstracts available.

FIGURE 1: PRISMA Flow diagram for recently conducted systematic reviews that solely involved database and registration searches.



RESULTS:

TABLE 1: CHARACTERISTICS OF THE INTERVENTIONS IN THE INCLUDED STUDIES.

S. NO	Author Name	Patient Selection	Duration	Intervention
1	Farvid M. S., Spence N. D., Holmes M. D., Barnett J. B., et al. (2020)	These studies collectively involved approximately 1.99 million women and reported on 67,735 breast cancer cases.	Studies ranged from 2-20 years.	The primary exposure assessed was dietary fiber intake, categorized into total fiber, soluble fiber, cereal fiber, fruit fiber, vegetable fiber, legume fiber and insoluble fiber. The studies employed food frequency questionnaires [FFQs] and 24 hour dietary records to assess fiber intake.
2	Louise Hansen et al. (2012)	1,168 incident cases of cancer (691 colon, 477 rectal) 108,081 Scandinavian participants	Median of 11.3 years	Dietary assessment of fiber intake, focusing on cereal fiber. Higher cereal fiber intake was associated with a reduced risk of colon cancer, particularly from foods with ≥ 5 g

				fiber per 100 g product
3	Bingham S. A., Day N. E., Luben R., Ferrari P., Slimani N., Norat T., Clavel- Chapelon F., Kesse E., Nieters A., Boeing H., Tjønneland A., Overvad K., Martinez C., Dorransoro M., Gonzalez C. A., Key T. J., Trichopoulou A., Naska A., Vineis P., Tumino R., Krogh V., Bueno-de- Mesquita H. B., Peeters P. H. M., Berglund G., Hallmans G., Lund E., Skeie G., et al. (2003)	519,978 individuals aged 25 - 70 years from ten European countries (Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, and the UK)	Participants were followed up for cancer incidence from 1992 to 1998, resulting in a total of 1,939,011 person years of follow-up	This was an observational study; no intervention was applied. Participants completed dietary questionnaires during 1992 - 1998 to assess their dietary fiber intake, and the study examined the association between fiber intake and the incidence of colorectal cancer

4	Pirjo Pietinen, Eric Rimm, Pasi Korhonen, Ann M. Hartman, Walter C. Willett, Dimitrios Albanes, Jarmo Virtamo , et al. (1996)	21,930 male smokers aged 50 - 69 years from southwestern Finland, free of diagnosed cardiovascular disease, who completed a validated dietary questionnaire at baseline. Participants were part of the Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study.	Median follow-up of 6.1 years (1992 - 1998).	This was an observational analysis within a randomized, double-blind, placebo-controlled trial. The primary trial investigated the effects of daily supplementation with α -tocopherol and/or beta-carotene on lung cancer incidence. The dietary fiber analysis was conducted independently of the supplementation groups.
5	F. Levi; C. Pasche; F. Lucchini; C. La Vecchia , et al. (2001)	286 colorectal cancer cases; 550 non-cancer hospital controls, Canton of Vaud (Swiss), 1992 - 2000	1992 - 2000 (~9 years recruitment period)	Observational FFQ-based fiber intake analysis (no dietary intervention)
6	Daniel W. Rosenberg, Charles Giardina, Takuji Tanaka , et al. (2009)	various mouse strains (e. g., C57BL/6, A/J, APC Min/+, BALB/c)	Typically 10 - 40 weeks	AOM or DMH injection, AOM + DSS, genetic models (e. g., APC Min/+), diet agents

Table 1 presents the characteristics of the studies included in the systematic review. All four studies

examined the role of Dietary Fibers in the prevention and promotion of cancer. However, the studies differed in terms of sample size, patient age and duration of outcome assessment.

TABLE 2: CHARACTERISTICS OF THE PRIMARY OUTCOME AND RESULTS OF THE STUDIES INCLUDED IN THE SYSTEMATIC REVIEW

S NO	Author Name	Outcome	Result
1	Maryam S, Farvid, Nicholas D. Spence, Michelle D. Holmes Junaidah B. Barnett. et al. (2020)	A higher intake of dietary fiber, particularly soluble fiber, may be associated with a reduced risk of breast cancer. This protective effect appears consistent across different menopausal statuses. The study supports dietary recommendations that emphasize the consumption of fiber-rich foods such as fruits, vegetables, whole grains, and legumes to potentially lower breast cancer risk.	<p>Total Fiber Intake: Women with the highest fiber consumption had an 8% lower risk of developing breast cancer compared to those with the lowest intake.</p> <p>Soluble Fiber: Associated with a 10% reduction in breast cancer.</p> <p>Insoluble Fiber: Showed a suggestive inverse association.</p> <p>Menopausal Status:</p> <ul style="list-style-type: none"> ● <i>Premenopausal Women:</i> Experienced an 18% lower risk. ● <i>Postmenopausal Women:</i> Had a 9% lower risk. ● <i>Hormone Receptor</i> <p>Status: The study observed non-significant inverse</p>

			<p>associations between total fiber intake and both estrogen and progesterone receptor - positive and - negative breast cancers.</p>
<p>2</p>	<p>Louise Hansen et al (2012)</p>	<p>Higher intake of dietary fiber, especially from cereal sources, may be associated with a lower risk of colon cancer. This supports dietary recommendations that emphasize the consumption of fiber-rich cereal foods as a potential strategy for colon cancer prevention</p>	<p>Total Dietary Fiber Intake (Men): An increase of 10 grams per day in total fiber intake was associated with a 26% reduction in colon cancer risk.</p> <p>Cereal Fiber Intake:</p> <ul style="list-style-type: none"> ● <i>Men:</i> Each additional 2 grams per day of cereal fiber intake correlated with a 6% reduction in colon cancer risk. ● <i>Women:</i> A similar increase in cereal fiber intake was linked to a 3% reduction in risk. ● High-Fiber Cereal Foods:

			<p>Consumption of cereal foods containing at least 5 grams of fiber per 100 grams was associated with a reduced risk of colon cancer in both men and women.</p> <p>● Rectal Cancer: No</p> <p>significant associations were observed between dietary fiber intake and rectal cancer risk</p>
3	<p>Sheila A. Bingham, Nicholas E. Day, Robert Luben, Pietro Ferrari, Nadia Slimani, Teresa Norat, Françoise Clavel-Chapelon, Emmanuelle Kesse, Alexandra Nieters, Heiner Boeing, Anne Tjønneland, Kim Overvad, Carmen Martinez, Miren Dorransoro, Carlos A. Gonzalez, Timothy J. Key, Antonia Trichopoulou, Androniki Naska, Paolo</p>	<p>In populations with low average dietary fiber intake, approximately doubling the intake from food sources could potentially reduce the risk of colorectal cancer by 40%.</p>	<p>Inverse Association: Higher dietary fiber intake was associated with a reduced incidence of large bowel cancer. Specifically, individuals in the highest quintile of fiber consumption had a 25% lower risk compared to those in the lowest quintile (adjusted relative risk. Calibrated Data: After calibrating with more detailed dietary data, the</p>

	<p>Vineis, Rosario Tumino, Vittorio Krogh, H. Bas Bueno- DeMesquita, Petra H.M. Peeters, Göran Berghlund, Göran Hallmans, Eiliv Lund, Guri Skeie, Rudolf Kaaks, Elio Riboli, et al. (2003)</p>		<p>protective effect appeared stronger, with a 42% risk reduction observed in the highest versus lowest quintile of fiber intake. Cancer: The protective effect of dietary fiber was most pronounced for cancers of the left side of the colon and least for rectal cancers. Sources of Fiber: No specific food source of fiber (e.g., cereals, fruits, vegetables) was found to be significantly more protective than others. It's important to note that the study did not investigate fiber from non-food supplement sources.</p>
<p>4</p>	<p>Pirjo Pietinen, Eric Rimm, Pasi Korhonen, Ann M. Hartman, Walter C. Willett, Dimitrios Albanes, Jarmo</p>	<p>The study concluded that in populations with low average intake of dietary fiber, an approximate doubling of total</p>	<p>21,930 male smokers (age 50 - 69) from the Alpha-Tocopherol, Beta Carotene (ATBC) Prevention Study, free of diagnosed CVD at</p>

	<p>Virtamo, et al. (1996)</p>	<p>fiber intake from foods could reduce the risk of colorectal cancer by 40%.</p>	<p>baseline, followed for 6.1 years. They tracked 1,399 major coronary events (first nonfatal MI + CHD death) and 635 coronary deaths. Higher total dietary fiber intake was associated with a significantly lower risk of coronary heart disease strongest for coronary death. Men in the highest quintile of total fiber intake (median 34.8 g/day) had a multivariate relative risk (RR) for coronary death = 0.69 compared with the lowest quintile. This association remained after adjustment for known cardiovascular risk factors and for intakes of saturated fat and vitamins.</p>
<p>5</p>	<p>F. Levi; C. Pasche; F. Lucchini; C. La Vecchia, et al. (2001)</p>	<p>Risk of colorectal cancer (colon & rectal combined and separately)</p>	<p>A significant inverse association was found between total dietary fiber intake and</p>

			<p>colorectal cancer risk.</p> <p>The odds ratio (OR) for a one standard-deviation increase in total fiber was 0.57 (i.e., a 43% risk reduction), after adjusting for age, sex, education, physical activity, and energy intake</p> <p>For fiber components, ORs per one-SD higher intake:</p> <ul style="list-style-type: none"> ● Soluble non-cellulose polysaccharides (NCP): 0.55 ● Total insoluble fiber: 0.58 ● Cellulose: 0.57 ● Insoluble NCP: 0.62 ● Lignin: 0.62 <p>Fiber sources associations:</p> <ul style="list-style-type: none"> ● Vegetables: OR 0.60 ● Fruit: OR 0.78 ● Grain fiber: OR 0.74
6	Daniel W. Rosenberg, Charles	Describes how mouse models mimic human	<p>1. AOM and AOM+DSS Models</p> <ul style="list-style-type: none"> ● Azoxymethane

	<p>Giardina, Takuji Tanaka, et al. (2009)</p>	<p>colorectal cancer at different stages (initiation, promotion, progression). Evaluates the relevance of each model for studying:</p> <ul style="list-style-type: none"> ● Sporadic colorectal cancer ● Inflammation-associated colon cancer ● Familial colorectal cancer syndromes (e. g., FAP, HNPCC) <p>Highlights how these models help identify molecular mechanisms and test chemo-preventive strategies.</p>	<p>(AOM) is effective in inducing colon-specific tumors.</p> <ul style="list-style-type: none"> ● AOM+DSS model closely mimics human colitis associated colorectal cancer. ○ Inflammation accelerates tumor development and progression. ○ Tumors are histologically similar to human CRC (including adenocarcinomas). <p>2. APC Min/+ Mouse Model</p> <ul style="list-style-type: none"> ● Develops numerous intestinal adenomas due to APC gene mutation. ● Useful for studying early tumorigenesis, though most tumors are in the small intestine, not the colon. ● Can be combined with other mutations or treatments to shift tumorigenesis to the colon. <p>3. Genetically</p>
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			<p>Engineered</p> <p>Models (GEMs)</p> <ul style="list-style-type: none"> ● β-catenin, p53, K-ras, and Smad4 mutations mimic human cancer pathways. ● Allow for precise mechanistic studies of gene interactions and targeted therapies. <p>4. Use in Chemoprevention</p> <ul style="list-style-type: none"> ● These models are widely used to test dietary and pharmaceutical agents (e.g., NSAIDs, curcumin, resveratrol) for tumor inhibition.
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Table 2: Shows the outcome and result of the effectiveness of Dietary Fibers in the studies mentioned above. The outcome and results were significant, indicating that Dietary Fibers plays a crucial role in cancer promotion and prevention. Higher intake of Dietary fibers are associated with decreased risk in colon and breast cancer, whereas adequate dietary intake and elevated levels correlated with a reduced risk of colorectal cancer.

TABLE: 3 RISK OF BIAS ASSESSMENT:

S. No.	Study (Author, Year)	Randomization Process	Deviations from Intended Interventions	Missing Outcome Data	Measurement of Outcome	Selection of Reported Result	Overall Risk of Bias
1	Farvid et al., 2020						
2	Hansen et al., 2012						

S. No.	Study (Author, Year)	Randomization Process	Deviations from Intended Interventions	Missing Outcome Data	Measurement of Outcome	Selection of Reported Result	Overall Risk of Bias
3	Bingham et al., 2003						
4	Pietinen et al., 1996						
5	Levi et al., 2001						
6	Rosenberg et al., 2009 (Animal study)	Not applicable					

Table:3 Shows the bias analysis of all the included studies. It is categorized as Low risk; some concern; high risk. Green colour indicates low risk for adequate methods and transparency bias unlikely to affect results; yellow colour indicates some concerns for uncertainty about risk of bias due to incomplete reporting or unclear procedures; red colour indicates high risk for clear flaws in design or reporting that may significantly affect results. Categorization was done according to all the RoB 2 second version of Cochrane’s risk of bias.

DISCUSSION

Dietary fibers are a group of carbohydrates present in plant foods that are indigestible by the human body. In contrast to other carbs (such as starches and sugars), fibers pass through the intestines and stomach relatively unchanged but they are critical for staying healthy. Dietary fibers consist of soluble, insoluble and fermentable fibers. Fibers in the diet perform various important functions in the body like Digestive Health, weight control, regulation of blood sugar, lowering cholesterol, heart health, cancer prevention, cleansing, maintains gut microbiota. Dietary fibers play dual role in the prevention and promotion of cancer. Intake of dietary fibers prevents the risks of colorectal cancers, breast cancers.

The association between dietary fiber intake and breast cancer risk shows potential mechanisms of fiber's role in regulating blood glucose, improving insulin sensitivity, increasing sex hormone-binding globulin levels, and affecting estrogen

metabolism through alterations in gut microbiota investigated by Maryam S, Farvid, Nicholas D.Spence,Michelle D.Holmes, Junaidah B.Barnet (2020)¹².The relationship between dietary fiber intake and colon cancer risk showed higher total fiber intake was inversely associated with colon cancer risk in men. Additionally, cereal fiber intake was associated with a reduced risk of colon cancer in both men and women. The fiber from cereal foods, particularly those with high fiber content, may play a protective role against colon, by Louise Hansen et al (2012)¹³.

Sheila A. Bingham, Nicholas E. Day, Robert Luben, Pietro Ferrari, Nadia Slimani, Teresa and colleagues (2003) investigated the association between dietary fiber intake and colorectal cancer risk across ten European countries. The findings revealed that higher fiber intake was inversely related to the incidence of colorectal cancer, with the strongest protective effect observed for cancers of the left side of the colon. No specific food source of fiber was found to be significantly

more protective than others. The study suggests that doubling the average fiber intake from foods could reduce colorectal cancer risk by approximately 40%¹⁴. Manuela Cassott, Danila Cianciosi, Rachele De Giuseppe, Maria Dolores Navarro-Hortal and colleagues (2023) highlighted that epidemiologic and interventional human studies support an association between Mediterranean-style diets, fiber-rich foods, and probiotics with reduced IBD activity and potentially lower CRC risk. Adoption of nutrient-dense, plant-rich dietary patterns (similar to the Mediterranean diet), Minimization of processed and red meats, alcohol, and high-fat Western foods, Supplementation with probiotics may offer a novel adjunct strategy to reduce inflammation and lower IBD-associated CRC risk¹⁵. The natural dietary compounds including fiber, probiotics, methionine, folate, vitamins D & E, selenium, carotenoids, phytoestrogens, Isothiocyanates, epigallocatechin Gallate (EGCG), curcumin, and resveratrol exert chemo-preventive effects by modulating gene expression connected to cell proliferation, differentiation, apoptosis, metastasis, angiogenesis, and inflammation. Pathways affected include COX-2 inhibition, suppression of NF- κ B signaling, and regulation of Wnt/ β -catenin, PI3K/Akt, and Notch-1 cascades was found by Anna Olejnik I, Joanna Tomczyk, Katarzyna Kowalska, Włodzimierz Grajek (2010)¹⁶.

The study conducted by F Levi · C Pascheb · F Lucchinia · C La Vecchiac,d with large prospective cohort studies which report modestly weaker associations between fiber intake and colorectal cancer risk. They emphasize that case-control studies like theirs often show stronger inverse relationships, possibly due to methodological differences. They acknowledge that prospective data still support a protective association, although of somewhat lesser magnitude than observed in case-control designs. The consistency of inverse associations across multiple fiber types (soluble, insoluble, lignin, cellulose) and fiber sources (vegetables, grains, fruits) strengthens the evidence¹⁷. The study is limited by its case control design with self-reported lifetime physical activity, raising concerns about recall bias and residual confounding¹⁸. Daniel W. Rosenberg, Charles

Giardina, and Takuji Tanaka focused on the strengths and limitations of different mouse models used in colon cancer research. It emphasizes how these models help in understanding human colorectal cancer mechanisms and testing preventive or therapeutic strategies. The authors also explore how genetic and inflammation-based models simulate human disease progression, and they highlight the importance of choosing models appropriate for specific research goals²⁰.

In overall, high fiber diet has been linked to a lower risk of certain types of cancer, particularly colorectal Cancer. Dietary Fiber helps keep the colon wall healthy, reducing the risk of colorectal cancer. It also supports regular bowel movements, reducing the time harmful chemicals spend in the bowel. Other Some studies suggest that a high-fiber diet may also reduce the risk of pancreatic, gastric, esophageal, and breast cancers^{19,20}. Cancer Prevention can be done by Binding Carcinogens, Producing Short-Chain Fatty acids, Maintaining Healthy Weight, Lower Cholesterol Levels, Blood Sugar Control. Average intake of dietary fibers for an adult individual is 15g-20g per day. On the other hand, Insoluble fibers (from bran, grains) increase stool bulk but may not offer strong anti-cancer properties. Soluble fibers (from oats, fruits, legumes) promote beneficial SCFA production but over-reliance on processed sources (like supplements) may not replicate natural benefits²¹. Excessive fiber intake (especially >40–50 g/day) may Cause bloating, gas, abdominal cramps, and diarrhea. Lead to intestinal obstruction in individuals with strictures, tumors, or previous bowel surgery. Aggravate symptoms in patients undergoing cancer treatments (chemotherapy/radiation), who often have sensitive digestive systems^{23,24}.

Although numerous studies highlight the protective role of dietary fibers against various cancers. More research is also needed to explore the complex interaction between dietary fibers and the gut microbiota, as individual variations in gut bacteria can influence the production of beneficial metabolites such as short-chain fatty acids²⁵. These fibers enhances programmed cell death of cancer cells similar to gingerol compound²⁶. Research should also address conditions under which fiber might promote tumor growth,

particularly in individuals with inflammation, dysbiosis, or advanced cancer. Future studies should consider lifestyle and dietary factors such as fat intake, smoking, and physical activity, which interact with fiber's effects on cancer risk.

CONCLUSION:

Dietary fibers play a significant role in the prevention and promotion of cancer. A high-fiber diet has been associated with reduced risk of various cancers, including colorectal, breast, and prostate cancer. The mechanisms underlying this association include modulation of gut microbiota, production of short-chain fatty acids, and regulation of inflammation and immune response. Increasing consumption of fiber-rich foods, such as fruits, vegetables, and whole grains, can be a valuable strategy for cancer prevention. These results support public health recommendations to increase dietary fiber intake for colorectal cancer prevention. Further research is needed to elucidate the specific mechanisms and optimal fiber intake levels for cancer prevention.

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