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Review Article

FUNCTIONAL FOODS FOR PREVENTION AND TREATMENT OF CANCER

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ABSTRACT

After cardiovascular diseases, in most developed nations cancer is the second leading cause of mortality. Additional to the rising tumor-related behaviors, especially smoking in developing nations, the global prevalence of cancer keeps climbing primarily cos of the aging and expansion of the global population. Lung carcinoma, liver carcinoma, intestinal carcinoma, colorectal carcinoma, breast carcinoma, stomach carcinoma, etc., are the largest global burden of cancer types. More than half of all cases of cancer and mortality are considered preventable globally. There are food components that, beyond basic nutrition, provide health benefits. These functional foods are known to do more than just provide nutrients because they help to sustain health and thereby decrease the risk of disease. In recent times, functional foods have acquired enormous importance for their anticipated visualized involvement in the treatment of various pathologies such as cancer. To see the impact of functional foods on wellbeing or cancer or associated states, there are very few researches performed worldwide. Several functional foods derived from diverse sources, such as plants, animals, and microbial sources, have noticeable anticancer effects. In this review, we show light on the different types of cancers and also highlighted different functional foods that can help in the prevention as well as treatment of different types of carcinoma.

Keywords: Tumor, Global burden, Food components, Functional foods, Anticancer.

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INTRODUCTION

Globally, more than 18 million new cancer cases are reported each year [1]. Globally, cancer brings growing health and economic burden and has the greatest effect on the most vulnerable communities [2]. To identify possible risk factors and generate strategies for cancer prevention, understanding the current cancer burden in different regions is important [3]. Cancer is a disorder that involves irregular cell growth that is likely to invade the other areas of the organisms' body, maybe malignant (may easily spread), or benign tumors (cannot spread to other parts) that display signs such as a lump or atypical bleeding [4]. In both men and women in the USA, lung cancer is the most frequent cause of death [5]. In India, mortality due to cancer from 1990 to 2016 has doubled. India's prevalence of cancer is analyzed to be around 1.15 million new patients in 2018 and is expected to nearly double by 2040 as a result of the rise in population only [6]. The best way to minimize the burden of cancers remains primary prevention through lifestyle and environmental measures [7].

Functional foods also known as nutraceuticals are highly nutritious and have several health benefits like protection against disease providing any sort of nutrition deficit and providing health growth to individuals [8]. They differ from conventional food as their specific components have direct linking toward the wellbeing of the consumer and have appropriate physiological effects over health that is related to a single product whereas conventional food like low-fat products, vegetables provide a healthy diet to an individual as a whole food rather than having part of any of the single product [9]. Prebiotic (a non-digestive food ingredient) distresses the host by exciting the evolution and motion of specific bacteria in the colon and probiotic (the microbial dietary supplement) shows beneficial outcomes on health are often used as a functional food [10]. As a change in the era and so with the categories of functional food, the American egg (natural functional food) is an exceptional dietary source of many vital (protein, choline) and non-vital (lutein/zeaxanthin) components which may encourage ideal health [11]. Some major nutraceuticals that are used as functional food are fatty acid (ω-3 fatty acids, conjugated linolenic acid, butyric acid), carotenoids, and antioxidants are beneficial in the treatment of coronary heart disease, immune response disorder, cancer, stroke prevention, cancer, and cataracts [12]. Functional foods aid the consumer in prime an improved life without altering eating customs [13]. These days' functional foods are marketed as a new category of food products, having the availability of such benefits is due to the presence of their functional or active constituents [1]. Functional food was first labeled in Japan in the late 19th century (the 1980s) for the food products that contain some detailed constituents that are therapeutically active and have some biological properties [14]. In china using of functional food means any illustration that privileges that the food product has certain physiological or nutritional quality, it can be any healthy function or activity that food will have a confident influence on the health and can be termed as a functional food [15]. Several studies have been done to aim the methodical sustaining of the calculated decision concerning functional food growth and these are firstly what is the health benefit these functional food claims; secondly which of the product they use and third about the communication format [16]. Certain plant-based functional food contains bioactive compounds and their pharmacological mechanism includes its hypolipidemic effect, these can be divided into six categories flavonoid, steroidal saponins, polysaccharides, alkaloids, and polyphenols. One of the mechanisms of action for the same is the inhibition of endogenous lipid biosynthesis [17]. A new category of functional food in the market can be listed as vitamins, minerals, antioxidants, omega-3 fatty acid prebiotics, and probiotics but the problem of degradation is that the main issue with many of these bioactive compounds and solution for the same is the isolation of these compounds from the environment that favor degradation or any other unwanted interaction. The demand for functional food by a consumer is constantly increasing [18]. This review focuses on the functional foods that help in the remedy and management of neoplasm and different diseases like CV that is a major burden for all of nation across the globe.

TYPES OF CANCER

Breast cancer

Breast cancer remains the predominant cancer risk for women, with mortality of 53,5341 and disability-adjusted life years of

14.8 million. In 2016, nearly 1.7 million cases of breast cancer emerged, making it globally the major cause of death and morbidity among females [19]. Every year, over a million people are expected to be diagnosed with breast tumors globally and over 410,000 will die of the illness, accounting for 14% of women [20]. There has been an overall rise in breast cancer diagnoses in recent years, due to many contributing factors. In 2017, an analysis showed a 33% rise in cases from 2005 to 2015, while population growth was 12.6%, aging 16.4%, and age-specific cases 4.1% [21]. Reproductive risk factors include the long history of menstruation, nulliparity, the present utilization of the postmenopausal hormone treatment, or contraceptives. The use of alcohol can also increase breast cancer risk [22].

Male breast tumors may be linked to <0.2% of deaths associated with cancer in men. Male breast tumor exists at a relatively low frequency, so study, clinical testing, and advancement of alternative drug methods are mainly focused on female cancer of the breast [23]. The low occurrence hypothesis between males is based on variations in hormones and a comparatively poor proportion of men's breast tissue. The malignancy is expected to be caused by an irregular absorption and metabolism of estrogen [24]. In contrast to female breast cancer, male breast carcinoma is infrequent and uncommon. Clearing this difference may be supported by a direct correlation with female breast cancer. Data in the Survival, Epidemiology, and End Results (SEER) program from 1973 to 2005 show that progress in the longevity of breast tumors in men has slipped behind that in women [25]. The best effective ways to reduce the chances of breast cancer are to maintain a healthy body, increase physical exercise, and limit the consumption of alcohol [26].

Colorectal cancer

Colorectal cancer is fourth among males and the third among females in terms of prevalence [27]. Colorectal cancer is primarily an elderly condition, with over 70% of people 65 years of age or older, and is a significant cause of illness and death in the aged. It is predicted that the number of cases will rise as age increases. It is the second most prevalent cancer in the United Kingdom [28]. Australia, Canada, New Zealand, the US, and regions of Europe are among the nations that have the highest occurrence rates. India, China, and portions of Africa are among the lowest-risk countries [29]. A substantial rise of 2–4 times in the occurrence of a colorectal tumor has occurred in Asian countries such as China, Japan, South Korea, and Singapore over the previous decades [30]. Every year around the world 1.8 million new cases are diagnosed [31]. Age, obesity, low intake of fruit and vegetables, lack of activity, smoking, excessive drinking of alcohol, and heavy consumption of refined or red meat are among the risk factors for colorectal cancer. However, developing countries around the world with a low risk of colorectal cancer have been developed, in recent years [32,33]. Fecal occult blood testing, digital rectal testing, and sigmoidoscopy are three available methods for screening of colorectal cancer. Sigmoidoscopy of these approaches has shown the biggest promise to minimize colorectal cancer mortality. The benefits of this screening procedure are that tumors in the rectum and distal colon can be diagnosed early and adenomatous polyps can be diagnosed and eliminated [34]. Despite advances in the management of this illness, 5-year longevity is just 62% in the US. Studies have shown that early diagnoses boost longevity and thus offer a basis for screening [35].

Lung cancer

About 100 types of cancer are categorized by organ and root tissue. Lung cancer is the primary cause of death of all these types. Every year, approximately 1.04 million new lung cancer cases are recorded globally, with the highest occurrence in North America and Europe [36]. In some nations, this epidemic of lung cancer mortality has decreased where tobacco control results in smoking but in other countries, it is rising rapidly [37]. Despite years of study, the outlook for lung cancer patients remains dysfunctional, with a survival rate of 14% across 5 years. However, in the early stages, lung cancer is treatable and most patients benefit from therapy, for example, prolonged lifespan or reduced symptoms [38]. The chance of getting lung cancer is 20–30 times higher than that of a non-smoker in his or her lifetime [39]. In developing nations, rates of lung cancer are increasing parallel to cigarette smoking. Future prevention and studies may concentrate on modifiable non-tobacco risk factors and explain the state-of-the-art exposures including non-cigarette products [40]. The 2004–2008 SEER data revealed the medium age of 71 years when lung cancer has been diagnosed. In patients under 20 years, no cases were diagnosed [41].

Stomach cancer

Stomach cancer (gastric carcinoma) is now the solitary most frequent and fatal malignancy in the globe, although it continuously declines in occurrence. Gastric cancer is the third largest cause of tumor mortality around the world, according to GLOBOCAN 2018 information. Stomach cancer, after cancers of the lungs, breasts, colorectal, and prostate is the fifth most frequently diagnosed neoplasm across the globe [42,43]. The primary causes of stomach cancer are unclear but diet plays a significant part in the advancement of this condition has been presumed. The nitrate or nitrate-rich foods and their products are widely implicated as causative agents. Studies have also indicated an elevated risk of gastric cancer from a diet high in carbohydrates or a high-salt diet [44]. The risk factors for stomach cancer also include smoking and *Helicobacter pylori* infection [45]. The stomach is the first location where food enters in sustained contact with gastrointestinal mucosa and several carcinogens and carcinogenic antagonists are found in the human food. It is fair to conclude from these results that environmental factors, in particular dietary factors, have the key etiological effects for stomach cancer [46].

Green and yellow vegetables contain high levels of Vitamin C and have been reported in many laboratory and epidemiological trials as defensive against stomach cancer. Research indicates that a high-Vitamin C diet can help, whereas a high-salt diet can increase the risk of stomach cancer [47]. In East Asia, Latin America, and Eastern Europe, and within particular subgroups in the USA, gastric cancer occurrence and mortality remain vastly disproportionate. Many reductions in gastric cancer resulted incidentally, due to better sanitation, hygiene, safe water supply, and improvements in food safety, quality, and availability [48].

Liver cancer

Liver cancer is the sixth-largest tumor diagnosed and the second largest cause of mortality around the globe. Around half the new cases and deaths were in China alone, with 466,100 cases and 422,100 deaths in 2015 [49]. In most countries, hepatocellular carcinoma (HCC) is the main histologic form of liver cancer and accounts for about 80% of total cases. The 2nd most frequent histologic form is intrahepatic cholangiocarcinoma, which accounts for around 15% of total cases [50]. There will be 1 million cases by 2030, and the burden of liver cancer is rising worldwide. Due to the highest prevalence of hepatitis B virus (HBV) infections in Sub-Saharan Africa and Asia, the morbidity of liver cancer is also high [51]. The major causing factor for the HCC histological form of liver cancer is HBV and/or HCV infections [52]. These causes have been identified as possible causing factors of liver carcinoma, such as dietary aflatoxin, betel nut chewing, alcohol intake, and smoking [53,54]. Since major risk factors of liver cancer can be changed, there are good hopes that prevention interventions such as improvements to the diet and hepatitis immunization can decrease the occurrence and death from the disease. Some of its etiological factors such as hepatitis infection and cirrhosis can be easily identified through screening to decrease liver cancer growth [55].

Pancreatic cancer

Pancreatic cancer, with which death is nearly parallel, is an extremely lethal disease. More than 2,00,000 deaths annually occur from pancreatic cancer globally [56]. Pancreatic cancer is less frequent from a global perspective than the lung, breast, stomach, liver, large bowel, and prostate tumors [57]. The 4th common cause of carcinogenic mortality in developing countries is pancreatic cancer but forecasted to be the 2nd leading cause for cancer-related death in the next 10 years if the figures are not changed [58]. Adenocarcinoma (accounts for nearly

85% of all cases) and pancreas endocrine tumors (represent fewer than 5% of all cases) are two primary forms of tumors in pancreatic cancer [59]. Smoking, chronic pancreatitis family history, aging, male, diabetic mellitus, obesity, non-O blood type, occupational exposures, African-American ethnicities, heavy fat diet, meat-rich diet, poor vegetable, and folate-related diets, and potential *H. pylori* are the main factors for this malignant condition. Although the cause of pancreatic cancer is complicated, multifactorial, cigarette smoking, and family history are prevalent [60]. Smoking rates raises the likelihood of pancreatic cancer, and it is suspected that smoking may be linked to as much as one in four cases of pancreatic cancer [61]. Present screening practices are restricted to individuals with family history and those considered to raise the risk of catching the disorder, often done with MRI or endoscopic ultrasound [62].

LIST OF ANTICANCER FUNCTIONAL FOODS

Europe scientific institute defined functional food as "a food product can only be considered as functional, if together with the basic nutritional impact it has a beneficial effect on one or more function of the human organism thus either by improving general and physical health or decreasing the risk of evolution of disease" [14]. Functional food often-called nutrition providing substances shows potentially active behavior in the treatment and prevention of cancer. Whey protein shows up ground-breaking and the suppositions have been made with confirmations that it segregates has a cytotoxic impact on melanoma. A lesser number of tumor foci was seen when whey protein hydrolysate was taken care of by two colon malignant growth bearing rodents [63]. Table 1 represents the list of functional foods along with their biological applications.

Cruciferous vegetables such as broccoli, cauliflower, and cabbage contain certain non-nutritional phytochemicals that are beneficial for cancer prevention, whereas onion and garlic contain certain biologically active compounds that have anticarcinogenic and anticholinergic effects, other functional foods include functional milk, dairy products, sea buckthorns, and some functional seafood lipid and proteins [65]. Whey protein or milk protein shows anticancer activity, as a functional food helps in the handling of chronic disease [66,67]. Folate a water solvable fully oxidized form of Vitamin B, it plays a significant share in the expansion of certain disease like cancer [68]. Linola seed holds oil that is amusing in linoleic acid and yield conjugated linoleic acid beneficially diminishes the jeopardy of breast cancer in women [69]. Functional food is used as CMDs medications because of its latent properties such as anti-inflammatory, antioxidants, antiestrogenic, and immunomodulatory; other purified bioactive complexes are superior to pharmaceutical drugs for the dealing of unembellished chronic symptoms [70]. Phenolic and polyphenolic compounds act as a specific part of secondary metabolites of plants that turn as free radical scavengers and inhibitors of LDL fatty acid oxidation and DNA cracking. As a result, dietary polyphenols are used to prevent cardiovascular diseases (CVDs) and certain tumors [71]. Prunes (*Prunus domestica* L.), dried plums fruits are very rich in bioactive compounds, their phenolic compounds inhibit human LDL oxidation *in vitro*, and plays a protective role against chronic disease cancer [72].

Table 1: List of functional foods with their biological applications [64]

S. No.	Functional foods	Biological application
1	Tea, onion, mushroom, ginger, garlic, carrot, berry	Decrease lipid, Anticarcinogenic
2	Apple, beetroot, broccoli, ginger, spinach	Enhanced drug detoxification, Anticarcinogenic
3	Garlic, green tea, onion	Antibacterial, Anticarcinogenic
4	Cabbage, fennel, soybean	Antiestrogenic, Anticarcinogenic
5	Garlic, green tea, orange	Anticarcinogenic

Apple

Apples are a major wellspring of dietary phytoconstituents like flavonoids. They additionally contain significant levels of polyphenols also, and different phytochemicals. The utilization of one apple daily was accounted for to lessen the danger of colorectal malignancy. The study also prophesied that the danger of colorectal tumor condensed around 50% upon feeding of supplementary per day an apple [73]. Apple phloretin (Ph), which can be acquired from apples and juices, is a popular inhibitor of the sort II glucose carrier (GLUT2). Expanded articulation of GLUT2 has been found in numerous human neoplasm tissues, including liver, breast, and gastric malignancy cells [74]. Apple extricates essentially restrained the TNF-R-initiated NF-$_{\kappa}$B enactment at a portion of 5 mg/ml. In malignant growth cells, NF-$_{\kappa}$B instigates protection from anticancer chemotherapeutic operators by expanding cell expansion and restraining apoptosis. Along these lines, restraint of NF-$_{\kappa}$B actuation in malignant growth cells is profitable in disease treatment by lowing the obstruction to chemotherapy [75]. Subsequently, apple utilization has been connected to a brought down danger of malignant growth [76].

Beetroot

Beetroot (*Beta vulgaris* L.) is a normally expended vegetable, which moreover has solid antioxidant properties. Beetroots and their juices from biological invention have a high content of bioactive complexes [77]. These nontoxic plants, when utilized and mixed with intense anti-cancer medications, for example, doxorubicin (Adriamycin), can act synergistically and relieve treatment-related medication poisonousness. Betanin, the betacyanin constituent essentially answerable for red beet shading, is a cancer prevention agent with an especially highly free radical-searching action and is a modulator of oxidative pressure [78]. Red beetroot leave is a common Mediterranean diet vegetable, which is an abundant and inexpensive source of natural antioxidant and anticancer nutrients and can be added to juice as it improves the juice's nutritional value and does not have a significant effect on its sensory properties [79].

Blueberry

Anthocyanins are reddish natural pigments, a category of flavonoids, widely circulated in fruit and particularly in blueberries (*Vaccinium* spp.). Epidemiological studies have associated their intake favorably with decreased mortality due to CVDs and some cancer types [80]. One of the natural and edible items containing a rich source of phenolic dietary compounds is Blueberry. Quercetin was previously shown to have cytotoxic effects on cancer *in vitro* as one of the most abundant dietary phenolic compounds present in blueberry extracts. Kaempferol is a blueberry extract flavonol similar to quercetin that has previously been shown to be effective for its anticarcinogenic effects [81]. *In vivo* and *in vitro* analysis of berries as antioxidants and anti-cancer agents has enhanced our understanding of the complex mechanism and their impact on population health and illnesses [82]. Blueberries act through pathways by which carcinogenesis has been prevented by inhibiting the production of pro-inflammatory molecules and oxidizing stress and products, such as DNA damage, inhibiting cell growth, and increased apoptosis [83].

Ginger

Ginger (*Zingiber officinale*) is an internationally recognized plant used in cooking and has long been considered to have therapeutic properties [84]. Ginger (*Z. officinale*), an individual from the *Zingiberaceae* family, contains sugars (50–70%), lipids (3–8%), terpenes, and phenol mixes as a constituent of ginger rhizome. Other than these, amino acids, crude fiber, debris, protein, phytosterols, nutrients, and minerals are additionally present [85]. The ginger has a huge part in treating a few infections including gastrointestinal complexities, treat stomach upset, looseness of the bowels, rheumatic problems, queasiness, basic colds, fever, and tipsiness. Furthermore, ginger has antineoplastic and chemopreventive properties. Ginger root and its fundamental phenolic mixes, for example, gingerols and zerumbone have anticarcinogenic action, cancer prevention agents, and calming movement by prompting

apoptosis in malignant growth cells [86]. The *Zingiberaceae* plants contain fundamental oils which include terpenoids, phenylpropanoids, flavonoids, and sesquiterpenes that have noteworthy antitumor action [87]. Steamed ginger provides a new source of chemical variation in its structure as compared to unprocessed ginger. Recently, a study found that ginger steam treatment substantially improved its anti-carcinogenic effects on colon cancer [88].

Grapes

Grapes are rich in polyphenols that are beneficial for the treatment of breast cancer it shows pro-apoptotic, anti-proliferative, anti-invasive, anti-angiogenic, and anti-metastatic action in breast cancer [89]. Resveratrol a polyphenolic compound in grapes is one of the potent anticancer agents; these compounds show the progression-inhibition effect on cancer cells [90]. Resveratrol derivatives slow the growth of cancer cells and manage CV effects also a neuroprotective and prevent metabolic diseases. Pterostilbene and piceid show a similar effect and inhibit cell proliferation as resveratrol on cellular antioxidation systems by enhancing cellular resistance [91]. Resveratrol additionally incorporates a few stages to detoxification or cell reinforcement compounds by actuating a redox touchy record factor [92]. Apoptosis is induced by resveratrol with the initiation of P53 and by suppression of protein translation in T47D human breast cancer [93].

Mushroom

Mushroom (*Inonotus obliquus*) has been utilized as a useful food and conventional Chinese spices for a long time, having anti-inflammatory, calming, and anticancer constituents [94]. Homopolysaccharides are accepted to be the key active mushrooms' polysaccharides, different sorts of polysaccharides of mushroom have natural properties such as anti-obesity, antidiabetic, antiviral, antimicrobial, and anticarcinogenic impacts that exhibit the numerous wellbeing advancing potential [95]. Therapeutic mushrooms with anticancer activity involve polysaccharides, polysaccharide-protein edifices, dietary fibers, specific sorts of proteins, terpenoids, steroids, phenols, and so forth [96]. In Traditional Chinese Medicine, Cordyceps has been utilized to treat a few conditions including cancer [97].

Onions

Onion is one of the most broadly and to a great extent devoured vegetables. From epidemiologic considers, onion utilization is popularly connected to decreased paces of cardiac illness [98]. Onions are crammed with hostile to malignancy sulfur mixes which are profoundly gainful for disease chemoprevention. Progressed contemplates having indicated that onion might be hinder the liver, colon, prostate, cellular breakdown in the lungs, and so forth with high cancer prevention properties [99]. *Allium* utilization has been contrarily recommending a chemoprotective function, for example, onions [100]. Fig. 1 shows different functional foods along with where they act in different stages of tumor progression.

Various natural carotenoids (natural fat-soluble pigment) such as carotene, lutein, zeaxanthin, lycopene, and astaxanthin besides beta carotene were proven to have anticholinergic activities; they inhibit cancer cell proliferation [101]. Moringa otherwise called horseradish tree or drumstick tree is the most read species for its anticancer activity and are utilized in nations where malnutrition is a colossal issue because its flowers, cases, leaves, and seeds contain great dietary benefit and used to forestall lack of healthy sustenance in individuals, and because of the nearness of certain bioactive compounds which shows pharmacological properties that show anticancer exercises and is possibly utilized as a functional food [102]. Tea polyphenol shows preventive measures against osteoporosis, cancer, and CVDs for those who consume three cups of tea per day [103]. Artichoke can be used as a source of functional food that prevents cancer in individuals [104]. Furthermore, these Palaeolithic eating regimens such as lean meats, fish, organic products, vegetables, nuts, and seeds show promising outcome in the counteraction of malignant growth cancer and all other CVDs as they contain ω-3 unsaturated fat, polyphenols, filaments, and plan sterols these bioactive mixes lessen the occurrence of illness like cancer [70]. Rice bran is an ironic basis of dietary fiber, minerals, vitamins, and vital fatty acids. Various revisions specify that rice is high in γ-oryzanol, which hinders tumor advancement [105]. The use of flaxseed has beneficial effects on colon physiology with a reduction in risk of or occurrences of colorectal cancer in both human and animal experiments. Taken separately, the risk from colonic neoplasms decreased, and cell growth management by several possible pathways is also correlated with each of its principal bioactive components including fibers, alpha-linolenic acid, lignans, and other phytochemicals [106]. Banana peel extract is listed as non-toxic to normal cells in compliance with the standards defined by the National Cancer Standard Institute [107].

Chronic non-transmittable diseases such as metabolic disorder, Type-2 diabetes, CVDs, and cancer happen because of helpless dietary propensities and upset way of life that can be treated by moving to a more advantageous eating regimen and refreshments decision [108]. The advancement of human eating routine since the past numerous years from the Palaeolithic eating regimen to the modern form of

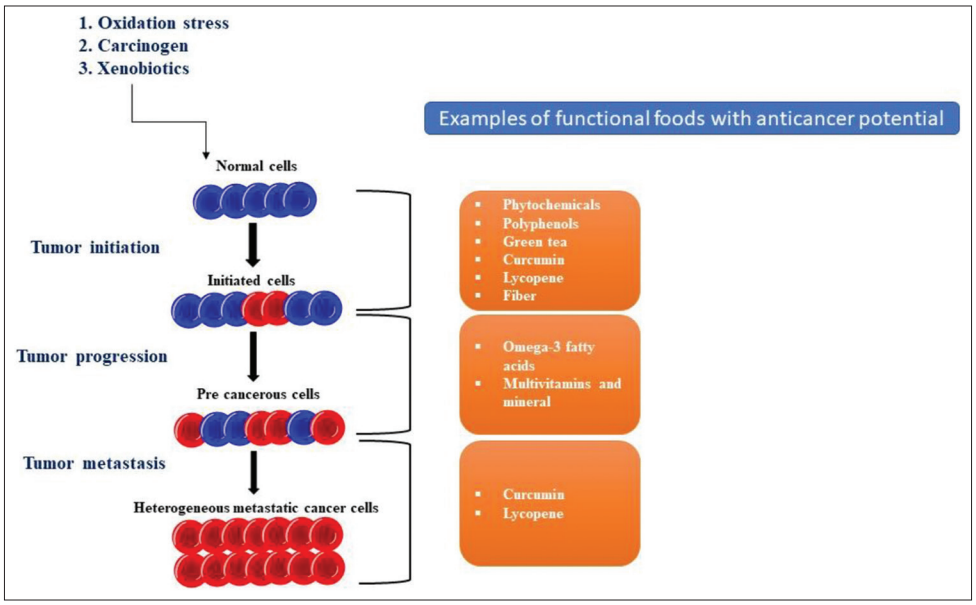

Fig. 1: The stages of tumor progression and where different functional food acts for the management

food has changed a ton that brings about stoutness and interminable illness such as CVDs and diabetes [109]. Functional foods built on their rudimentary nourishing roles can cut the hazard of many chronic diseases and show functional benefits, promoted with the privilege of their capability to diminish cardiac conditions, focusing mainly on recognized risk aspects, such as hyperlipidemia, diabetes, obesity, and raised lipoprotein [110]. Strategies have been made for the prevention of malignancy in humans with amplified ingesting of functional foods such as barley, brown rice, buckwheat, and whole grains and vegetables such as broccoli, cabbage, garlic, mushrooms, and onions, or some drinks such as coffee and green tea [111].

CONCLUSION

A balanced, well-working body culminates in an adequate diet, resulting in the achievement of proper human physiology, thus balanced living. Dietary variables are recognized as having a major impact on cancer risk, with risks being both increased and decreased by various dietary components. Diets are associated with many deaths from cancer, while physical inactivity tends to be associated with the risk of cancer. Researchers have made progress in our understanding of the relationship between functional foods and cancers in recent decades, especially in the area of prevention. In general, this paper addresses functional foods for cancer prevention and health benefits. Some functional foods such as green tea and red grapes have demonstrated anticancer efficacy by inhibiting pathological angiogenesis. Through the scavenging of free radicals, some functional foods displayed anticancer activity, such as berries, broccoli, cabbage, carrots, cauliflower, chocolate, garlic, grapes, green tea, onions, soybeans, tomatoes, prunes, and citrus fruits. The intrinsically chemopreventive existence of foods and/or their components and functional foods should not be completely believed and acknowledged.

AUTHORS' CONTRIBUTIONS

Both the authors have contributed equally.

CONFLICTS OF INTEREST

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