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Complementary Nutrition and Supplement Use in Oncology: Enhancing Outcomes or Complicating Care? A Comprehensive Review

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Keywords: Cancer Therapy, Chemoprevention, Complementary Medicine, Drug-Supplement Interactions, Oncology Nutrition

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Abstract

Cancer patients are increasingly using nutritional supplements, which raises questions about safety as well as possible advantages. This review looks at the functions of vitamins, probiotics, polyphenols, and immune-boosting foods in cancer treatment. Certain supplements can enhance treatment results, lower inflammation, or boost the immune system, but others might be harmful, particularly if taken unsupervised. Their safe usage is complicated by interactions with chemotherapeutic medicines, variations in supplement formulations, and individual variances (e.g. gut microbiota, genetics). Clinical application is further restricted by varied study designs and a lack of established protocols. In order to make sure supplements help cancer treatment rather than impede it, this study highlights the need for patient-provider communication, individualized approaches, and more thorough research.

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Introduction:

Background

Supplemental nutritional therapies are being investigated more and more in cancer therapy, with the potential to improve therapeutic efficacy, lower toxicity, and improve outcomes by utilizing vitamins, polyphenols, probiotics, and fatty acids. Between 30 and 90 percent of cancer patients use nutritional supplements, frequently without the knowledge of their doctors, demonstrating how this profession responds to patient demand. But a crucial question still stands: do these treatments actually enhance care, or do they pose needless risks? (Inglis et al., 2019).

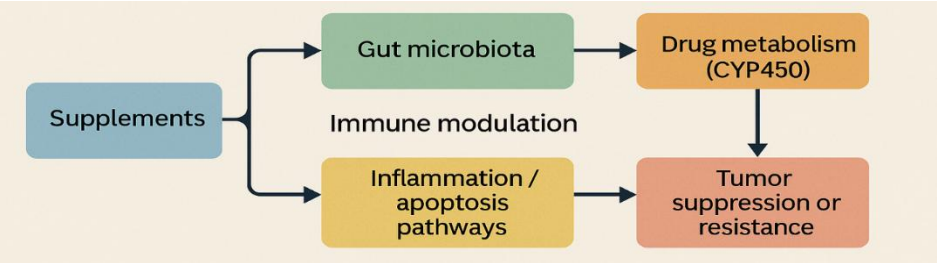
Potential advantages are suggested by preclinical and clinical data. In oral squamous cell cancer, vitamin D exhibits pro-apoptotic and anti-proliferative properties, making it a promising

biomarker and chemopreventive therapy. In osteosarcoma, nutraceuticals such as oleuropein (found in olive oil) exhibit synergistic cytotoxicity with chemotherapeutics (such adriamycin) while providing cardioprotection. Through pro-apoptotic and anti-inflammatory processes, polyphenol-rich substances, like green tea extracts and grape seed flour, may reduce prostate carcinogenesis and cancer cachexia, which affects 80% of advanced patients (Grimm et al., 2015; Hung et al., 2023). Complementary therapies seek to reduce toxicities in addition to their direct anti-tumor actions; Fish oil's omega-3 fatty acids are being investigated for their capacity to alleviate the devastating peripheral neuropathy caused by oxaliplatin. With probiotics like Clostridium butyricum CBM588 increasing checkpoint inhibitor efficacy in metastatic renal cell cancer and markedly increasing progression-free survival, the gut microbiome becomes a crucial modulator (Melato et al., 2025).

There are major obstacles in the way of this promise. Effectiveness varies: Supplementing with selenium is controversial; while some studies have connected it to radioprotection and decreased DNA damage, Cochrane reviews have indicated no overall reduction in cancer risk and possible increases in certain malignancies. There are obstacles to bioavailability: Metabolic alterations in green tea polyphenols, such as EGCG, may reduce their apparent activity in vitro (Azmoonfar et al., 2024). There are significant safety risks: Poor results are associated

Figure 1

Potential Pathway of Supplement Action in Cancer Care



with selenium deficiency, but supplementation increases the danger of overdose (selenosis), which is made worse by widespread, unmonitored self-medication. There are still methodological flaws: As demonstrated by polyphenol trials for cachexia and microbiota modulation, the sector is beset by small sample sizes, varied designs, and variable supplement composition, which can result in inconsistent outcomes. Clarification is necessary for complex interactions: Although the gut microbiota may be involved in vitamin D's immunomodulatory effects, it is unknown how clinically relevant this interaction is in situations like colorectal cancer (Rodríguez-Daza et al., 2021)

The research about supplements and supplemental nutrition in oncology is thoroughly compiled in this review. We look at the safety profiles, clinical effectiveness, and mechanistic justification of important agents (vitamins, polyphenols, fatty acids, probiotics, and minerals) in relation to various cancer kinds and settings. Most importantly, we tackle the fundamental conflict between the benefits of therapeutic synergy and patient empowerment and the dangers of toxicity, treatment interference, and unsupported claims. By assessing whether these initiatives improve outcomes or make care more difficult, we hope to offer an evidence-based strategy for negotiating this challenging environment (Scafuri et al., 2025).

Aim of the Study

The purpose of this study is to critically evaluate the information currently available about the use of dietary supplements and secondary nutrition

during therapy of cancer. It seeks to explore their potential therapeutic benefits, associated risks, and clinical significance with a focus on drug-supplement interactions, immunological modulation, and patient safety. The study also aims to pinpoint knowledge gaps and offer directions for additional research and clinical advice.

Methodology

For this analysis, information was collected and examined from peer-reviewed articles, clinical trials, and observational studies that were published between 2010 and 2025. Relevant material was located using keywords like "cancer," "nutritional supplements," "drug-supplement interaction," and "complementary therapies" in databases like PubMed and Google Scholar. Studies involving human subjects were prioritized, particularly those involving cancer patients undergoing treatment. Both observational studies and randomized controlled trials were considered to provide a comprehensive picture. Articles with insufficient clinical detail or that were not available in English or inaccessible were not included. Following that, the information was grouped according to the kind of supplement, cancer kind, treatment environment, and documented results.

Article Summaries

"The Effect of Oral Nutritional Supplementation Combined with Probiotics on the Liver Function and Intestinal Microflora in Lung Cancer Chemotherapy Patients through the Gut-Liver Axis" (Li et al., 2025).

This randomized controlled study evaluated whether giving probiotics together with oral nutritional supplements (ONS) enhances gut microbiota and liver function in patients with lung cancer receiving chemotherapy. 113 patients in all were split into probiotic and placebo groups, each of whom received ONS and a regular diet. After 21 days, the probiotic group's endotoxin levels were lower, and their liver enzyme levels (ALT, AST) were noticeably better. Additionally, there was a positive change in the gut flora, with lower concentrations of dangerous bacteria, including Escherichia coli and Enterococcus faecalis, and higher amounts of Lactobacillus acidophilus, Bifidobacterium longum, and Bacteroides fragilis. However, neither the immune system nor nutrition showed any significant changes. According to the results, probiotics may improve gut and liver function during chemotherapy by acting on the gut-liver axis (Li et al., 2025).

"A Plea for Monitoring Serum Selenium Levels in Breast Cancer Patients: Selenium Deficiency Is Rare during the First Year of Therapy, and Selenium Supplementation Is Associated with Elevated Risk of Overdosing" (Altmayer et al., 2024).

Serum selenium levels and supplementation with selenium were monitored for a year in this prospective investigation of 110 individuals with non-metastatic breast cancer. Selenium levels were often within the acceptable range at diagnosis, and deficiencies were uncommon. In spite of this, almost 25% eventually took supplements, which frequently led to selenium overdosing. Although dietary practices, particularly the consumption of mushrooms, showed a positive correlation with selenium status, supplementation dramatically raised serum selenium levels. There were no obvious connections between selenium levels and the disease's stage or the kind of treatment. The study emphasizes that regular supplementation is frequently superfluous and can result in selenosis and additional costs. Rather, safer and more economical approaches were suggested, such as testing selenium at diagnosis and suggesting diet-based sources. In general, the authors recommend rigorous selenium monitoring over automated supplementation in the management of breast cancer (Altmayer et al., 2024).

"Live bacterial supplementation for improving treatment response in metastatic renal cell carcinoma" (Meza et al., 2022).

A phase I clinical study assessing the effects of CBM588, a live bacterial supplement containing Clostridium butyricum, on treatment outcomes for metastatic renal cell cancer (mRCC) is discussed in this article. Two immune checkpoint inhibitors (CPIs), nivolumab and ipilimumab, were added to the supplement. The CBM588 group demonstrated a considerably longer survival without progression (12.7 compared to 2.5 months) and greater response rates, despite the fact that the primary endpoint—improving intestinal Bifidobacterium spp.—was not achieved. The groups' safety profiles were similar. These findings demonstrate how altering the gut microbiota may increase the effectiveness of CPIs. However, bigger randomized studies are required prior to clinical acceptance because of the exploratory character and limited sample size (Meza et al., 2022).

"Colorectal cancer, Vitamin D and microbiota: A double-blind Phase II randomized trial (ColoViD) in colorectal cancer patients" (Bellerba et al., 2022).

This study used a double-blind, Phase II randomized experiment termed ColoViD to investigate how vitamin D supplementation affected the gut microbiota of individuals with colorectal cancer (CRC). Over the course of a year, 74 individuals with colorectal cancer who had finished treatment were randomized to receive either a placebo or 2000 IU of vitamin D daily. According to the study, vitamin D dramatically changed the abundance of 32 microbial pathways and 63 gut bacterial species. Supplementation enhanced the number of some beneficial bacteria, including Bacteroides gallinarum and Faecalibacterium prausnitzii. Increased vitamin D levels were partially explained by these microbial alterations, according to mediation analysis. Both metabolic pathways and microbiome showed gender variations. Additionally, the study found that a baseline presence of Fusobacterium nucleatum predicted a worse disease-free survival rate. These results demonstrate the intricate relationship between microbiome, vitamin D, and cancer outcomes (Bellerba et al., 2022).

"Interactions in Cancer Treatment Considering Cancer Therapy, Concomitant Medications, Food, Herbal Medicine and Other Supplements" (Wolf et al., 2022).

The frequency and intensity of interactions between cancer treatment, other drugs, food, and complementary or CAM (alternative medicine) in cancer patients who are outpatients were examined in this study. Of the 115 patients, 62% experienced significant drug-drug interactions, and more than 92% had at least one possible interaction. Medications with myelotoxic or hepatotoxic potential and QT-prolonging combinations were the most prevalent. Two-thirds of patients were susceptible to drug-CAM interactions, especially with vitamin C, ginger, and mistletoe, while about 37% of patients utilized CAM drugs. 29% of patients had probable food-drug interactions, particularly when taking medications like levothyroxine and ciprofloxacin with meals or mineral water. In order to properly manage these risks, the study highlights the importance of regular interaction monitoring, increased physician knowledge, and patient counseling (Wolf et al., 2022).

"Dynamic changes in practical inflammation and immunity markers in cancer patients receiving immune enhancing nutritional supplementation during concurrent chemoradiotherapy" (Homkham et al., 2021).

The impact of immune-enhancing nutrition (IMN) on immunological markers and inflammation in cancer patients undergoing concurrent chemoradiotherapy (CCRT) was investigated in this study. It concentrated on two blood markers that indicate inflammation and immunological status: the neutrophil to lymphocyte ratio (NLR) and the absolute lymphocyte count (ALC). During therapy, 88 patients' NLRs elevated, and their ALC sharply dropped, indicating a deteriorating immune response. Only ALC demonstrated a substantial improvement at the end of treatment in patients

with head and neck cancer, despite IMN supplementation showing a trend toward milder changes in these markers. According to the study, IMN may lessen immune suppression during CCRT; nevertheless, additional focused studies are required to validate its advantages for various cancer types (Homkham et al., 2021).

"Assessment of the Nutraceutical Effects of Oleuropein and the Cytotoxic Effects of Adriamycin, When Administered Alone and in Combination, in MG-63 Human Osteosarcoma Cells" (Gioti et al., 2021).

This study looked at how oleuropein (OLEU), a crucial phenolic found in olives, affected MG-63 osteosarcoma cells when taken either alone or in combination with the deadly chemotherapy medication Adriamycin (ADR). By itself, OLEU dramatically reduced increased the cytotoxicity of ADR at lower doses and caused dose-dependent proliferation of cancer cells. ADR halted the G2/M phase of the cell cycle, according to flow cytometry, although OLEU had no discernible effect on the cell cycle's distribution. OLEU activated autophagy at the molecular level by upregulating the expression of many genes and proteins linked to autophagy. Interestingly, OLEU and ADR combined caused a significant metabolic imbalance in the cells by interfering with autophagic mechanisms. During co-treatment, metabolomic profiling revealed decreases in important metabolites such as ATP, glutathione, and phosphocholine. All things considered, the evidence points to OLEU enhancing ADR's anti-cancer effects via disrupting the tumor cells' defense mechanisms of autophagy. In the treatment of osteosarcoma, the authors suggest OLEU as a promising, non-toxic supplement to chemotherapy (Gioti et al., 2021).

"The role of Protopine associated with Nuciferine in controlling adverse events during hyperthermic intravesical chemotherapy instillations. A nutraceutical approach to control adverse events during intravesical instillations" (Chiancone et al., 2020).

This clinical research investigates the effectiveness of protopine and nuciferine, two plant-derived alkaloids, in lowering lower urinary tract symptoms during hyperthermic intravesical chemotherapy (HIVEC®) for non-muscle invasive bladder cancer (NMIBC). For eight weeks, one hundred patients were randomly assigned to either the treatment or placebo groups. The former received a daily syrup containing the two drugs. The therapy group reported significantly reduced symptoms of urgency, pain, and overactive bladder based on validated criteria such the IPSS, PPIUS, and VAS. While uroflowmetric measures like flow rate remained mostly unchanged, the therapy group's annulled volume increased. Importantly, there were no adverse side effects associated with the nutraceutical regimen. These findings suggest that nuciferine and protopine may be helpful supplements for the management of HIVEC-related pain. The study's limitations, such as its linear design and sample size, necessitate further multicenter research to corroborate these preliminary results (Chiancone et al., 2020).

"Tolerability and Safety of a Nutritional Supplement with Potential as Adjuvant in Colorectal Cancer Therapy: A Randomized Trial in Healthy Volunteers" (Gómez de Cedrón et al., 2019).

In order to assess the safety and immunological advantages of a dietary supplement that included alkylglycerol-rich shark liver oil (AKG) and rosemary extract (RE), 60 healthy subjects took part in this randomized, double-blind pilot study. Over the course of six weeks, participants received either the active supplement or a placebo. The data showed no adverse changes in liver function, oxidative stress markers, or vital signs, indicating excellent tolerance. Following the intervention, there was an increase in immune cells, such as CD14+, CD16+, and CD8+ lymphocytes, suggesting enhanced innate and cytotoxic immune responses. The supplement also changed cytokine responses to LPS stimulation and decreased the expression of genes linked to

inflammation and cancer, including JAK1 and NFE2L2. Furthermore, genotype-dependent responses were noted, linking certain SNPs to changes in immune cells. The supplement's potential as an immune-supportive partner in the cure or mitigation of colon cancer is supported by these findings (Gómez de Cedrón et al., 2019). "Curcumin dietary supplements and everolimus-based cancer treatment" (Mir et al., 2018).

In this investigation, dietary supplements containing curcumin, namely piperine, may have impeded the effectiveness of everolimus chemotherapy in two cancer cases. Both people had blood levels of Everolimus (Cmin) fluctuating; they increased substantially when curcumin intake was stopped and decreased again when it was resumed. The development and resolution of side effects, like stomatitis, were linked to these changes. The findings suggest that curcumin may influence the CYP3A4 enzyme, which in turn may affect how medications are metabolized. The research field emphasizes the importance of effectively tracking drug levels throughout therapy and advising cancer patients about dietary supplementation, even though more research is needed (Mir et al., 2018).

"Probiotic Survey in Cancer Patients Treated in the Outpatient Department in a Comprehensive Cancer Center" (Ciernikova et al., 2017).

The usage of probiotics by cancer patients receiving outpatient treatment at the National Cancer Institute in Slovakia was examined in this study. Probiotics were utilized by 28.5% of the 499 individuals surveyed, primarily at the advice of their physicians or chemists. Patients who were female, between the age brackets of 60 and 74, and who had previously taken other dietary supplements were more likely to utilize probiotics. The hazards of sepsis, particularly in immune-compromised people, were not known to 86.6% of users, despite the apparent advantages such as better digestion and fewer adverse effects from chemotherapy. Just 8.5% of respondents experienced adverse side effects. The results highlight a serious deficiency in patient education regarding the safety of taking probiotics while receiving cancer treatment. To guarantee the safe incorporation of complementary medicines, the authors recommend enhanced interaction between patients and oncologists (Ciernikova et al., 2017).

"Dangerous Combinations: Ingestible CAM Supplement Use During Chemotherapy in Patients with Ovarian Cancers" (Andersen et al., 2013).

The use of dietary supplements for complementary and alternative medicine (CAM), such as vitamins, teas, and herbs, by women receiving chemotherapy for ovarian cancer was investigated in this study. Of the 200 patients undergoing chemotherapy, 40% said they were using at least one supplement that would conflict with their cancer treatment. The potential for antioxidants and drugs that modulate liver enzymes, particularly CYP450, to decrease the effectiveness of chemotherapy or change drug metabolism made them particularly concerning. 24% of patients sought advice from a CAM provider on supplement use, while only 42% of patients sought advice from a conventional physician despite the hazards. Fish oil and green tea, two often utilized products, were noted as possibly harmful. The study urges more research to comprehend true hazards and guarantee safety, and it emphasizes the necessity of improved communication between patients and doctors (Andersen et al., 2013).

"Green Tea Polyphenols and Metabolites in Prostatectomy Tissue: Implications for Cancer Prevention" (Wang et al., 2010).

This study investigates the metabolism and absorption of green tea polyphenols, particularly EGCG, in the human prostate as well as their possible contribution to stop prostate cancer. Before surgery, men with localized prostate cancer drank green tea for a few weeks. Prostate tissues were shown to contain both EGCG and its methylated form (4-MeEGCG), indicating tissue-level absorption. However, in LNCaP prostate cells, methylation EGCG shown a diminished

capacity to control inflammatory NF-κB activation, cause apoptosis, and prevent the development of cancer cells. This implies that methylation might lessen EGCG's ability to combat cancer. The results highlight how individual metabolic variations, including COMT enzyme activity, have a major impact on how dietary polyphenols work as chemo preventives (Wang et al., 2010).

Table 1

Data obtained from research articles.

Author(s)	Year	Study type	Nutraceutical Intervention	Key Findings	Relevance to review
(Li et al., 2025)	2025	Randomized controlled study	Probiotic	Improved gut microbiota in lung cancer chemotherapy	Supports probiotics use in patients during chemotherapy
(Altmayer et al., 2024)	2024	Prospective Study	Selenium	Selenosis	Patients with breast cancer who take selenium must be closely monitored
(Meza et al., 2022)	2022	Phase I Clinical Trial	Live bacterial supplementation with CBM588	Increased efficacy of checkpoint inhibitors	Supports Live bacterial supplementation as Adjutants
(Bellerba et al., 2022)	2022	Phase II Clinical Trial	Vitamin D oral 2000 IU/day	Increased Vitamin D level in body Increased Gut Microbiota	Supports Vitamin D as cancer protective and increased gut microbiota
(Wolf et al., 2022)	2022	Cross-sectional study	Food, and other supplements	For 28.7% of all patients, food-drug interactions were probable. For example Bortezomib, Dexamethasone and Ginger interaction leads to Increased levels of bortezomib. and dexamethasone due to CYP3A4 inhibition by ginger.	Supports to monitor Food-drug interaction during chemotherapy.
(Homkham et al., 2021)	2021	Randomized controlled study	dietary supplement with arginine (6.16 g), L-glutamine (3.07 g), and fish oil (2.73 g) to boost immunity	Significantly encouraging improvements in the absolute lymphocyte count (ALC) and neutrophil lymphocyte ratio (NLR) values.	Supports use of immune enhancing nutritional supplements.

Author(s)	Year	Study type	Nutraceutical Intervention	Key Findings	Relevance to review
(Gioti et al., 2021)	2021	InVitro Study	Oleuropein (OLEU)	Chemoprotectant,Anti-carcinogenic and Autophagy Inducer	Supports Oleuropein Anti-carcinogenic
(Chiancone et al., 2020)	2020	Clinical Trial	Protopine and Nuciferine(Alkaloid)	Significantly reduced symptoms of non-muscle invasive bladder cancer (NMIBC) with HIVEC chemotherapy, including discomfort, urgency, and overactive bladder	Protopine and Nuciferine may serve as effective adjuncts in managing HIVEC (hyperthermic intravesical chemotherapy instillations) related discomfort.
(Gómez de Cedrón et al., 2019)	2019	Clinical Trial	Shark liver oil (SLO) enhanced with alkylglycerols (150 mg) and rosemary supercritical extract (11.25 mg of diterpene phenols).	Increased numbers of immune cells, including CD14+, CD16+, and CD8+ lymphocytes. Decrease oncogenes Expression	Supports Rosemary extract as Immuno-nutritional co-adjuvant in the treatment or prevention of colorectal cancer.
(Mir et al., 2018)	2018	Scientific Report	Curcumin dietary supplements	CYP3A4, the primary enzyme involved in everolimus metabolism, may be induced by curcumin	Highlight the contraindicated use of Curcumin supplements in everolimus chemotherapy.
(Ciernikova et al., 2017)	2017	Prospective study survey	Probiotic	Beneficial in GIT disturbances, Elimination of vomiting associated with chemotherapy Minimal Side effects	Support probiotics use in chemotherapy with patient education
(Andersen et al., 2013)	2013	Cross-sectional study	Supplements including Antioxidants And herbs(Green Tea)	Cisplatin and green tea (herb) interaction and antioxidants (vitamin A, C) and paclitaxel interaction may lead to metabolism alteration.	Supports to contraindication supplements (like green tea and vitamin C) during chemotherapy of some drugs.
(Wang et al., 2010)	2010	Randomized Clinical Trial	Green Tea(Polyphenols)	Chemo-protective and anti-carcinogenic effect dependent on COMT Polymorphism	Supports green tea as a Chemoprotective

Key Findings:

Potential Benefits

Probiotics: May improve liver function through the gut-liver axis, improve gut microbiota, and lessen the negative effects of chemotherapy, such as nausea and diarrhea. Certain strains (such as Clostridium butyricum CBM588) have the potential to increase the effectiveness of checkpoint inhibitors as in metastatic Renal Cell Carcinoma (mRCC.) (Li et al., 2025).

Vitamin D: May operate as a chemopreventive agent or biomarker, has pro-apoptotic/anti-proliferative effects in oral Squamous Cell Carcinoma (SCC), and positively modifies gut microbiota such as increased Faecalibacterium prausnitzii in Colorectal Cancer (CRC) (Bellerba et al., 2022; Grimm et al., 2015).

Polyphenols

1. Green Tea (EGCG): Green tea (EGCG) has the ability to prevent prostate cancer through chemotherapy, but its effectiveness is greatly diminished by methylation, which is regulated by the Catechol-O-MethylTransferase (COMT) polymorphism (Wang et al., 2010).
2. Oleuropein (Olive): Enhances cytotoxicity and provides cardioprotection when combined with chemotherapy such as Adriamycin in osteosarcoma (Gioti et al., 2021).
3. Plant Alkaloids (Protopine/Nuciferine): During intravesical chemotherapy for bladder cancer, they effectively alleviate lower urinary tract symptoms such as pain and urgency (Chiancone et al., 2020).
4. Immune-Enhancing Nutrition (IMN): During chemoradiotherapy, it may lessen immune suppression with better Neutrophils Lymphocytes Ratio (NLR) and Absolute Lymphocyte Count (ALC) (Homkham et al., 2021).
5. Rosemary/Shark Liver Oil: Shows promise as an adjuvant by exhibiting immuno-modulatory effects in healthy individuals by increased immune cells and decreased inflammatory genes (Gómez de Cedrón et al., 2019).

Figure 2

Common Supplements Categories and their targets.

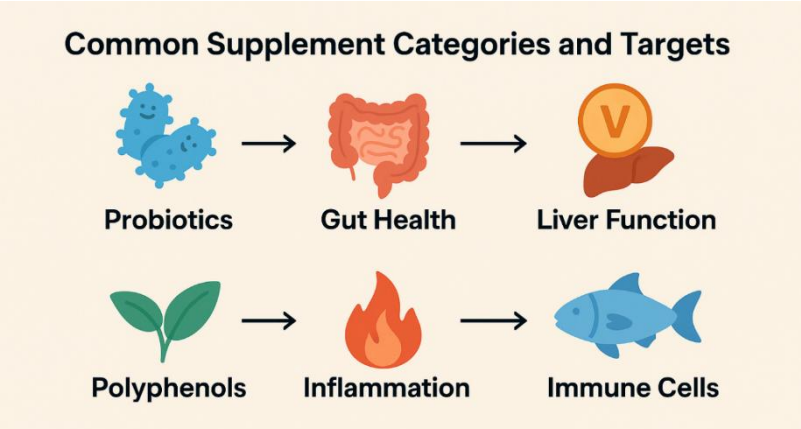


Figure 2: Common Supplements Categories and their targets (vii)- Omega-3 Fatty Acids: Being researched to help treat peripheral neuropathy brought on by chemotherapy such as oxaliplatin (Melato et al., 2025).

Significant Risks & Challenges:

Drug-Supplement Interactions

1. Over 92% of patients are at risk for drug-supplement interactions, which is a serious problem. Common Interactions Involve:

2. (CYP450 modification such as curcumin promotes CYP3A4, which lowers Everolimus levels and ginger inhibits CYP3A4 which raises levels of Bortezomib/Dexamethasone (Mir et al., 2018).
3. Vitamins A and C are antioxidants that may interfere with the mechanisms of chemotherapy, such as paclitaxel and cisplatin (Andersen et al., 2013).
4. Interactions between food and medication (e.g. Levothyroxine/Ciprofloxacin with minerals) (Wolf et al., 2022).

Safety Risks in Vulnerable Populations

Immuno-compromised patients who take probiotics run the risk of developing sepsis, however 86.6% of patients are unaware of this (Ciernikova et al., 2017; Li et al., 2025).

Overdose & Toxicity

While selenium deficiency is rare in people with breast cancer, taking supplements of the mineral commonly results in overdose (selenosis). Without monitoring, routine supplementing is discouraged (Altmayer et al., 2024).

Variable Efficacy & Bioavailability

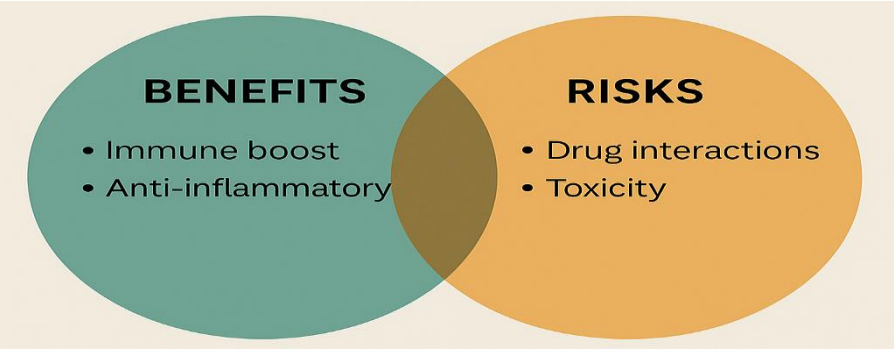
Results are not always consistent such as mixed evidence on radioprotection/cancer risk for selenium (Altmayer et al., 2024).

Methodological Limitations

Many A lot of research produce conflicting results because of their limited sample sizes, diverse designs, and fluctuating supplement formulations.

Figure 3

Risks and Benefits of Common Supplements in Cancer Care



Critical Need for Patient-Provider Communication

Rather than turning to oncologists for advice, patients frequently turn to CAM providers or pharmacists. It is common for supplement dangers to go unreported and uninformed. Safe integration requires improved counseling and communication.

Discussion

The intricate balance between the possible advantages and disadvantages of nutritional supplements in cancer treatment is highlighted in this review. Clinical results frequently rely on patient-specific factors including genetics, microbiome variety, and concurrent medications, even though substances like probiotics, vitamin D, and polyphenols show promise in anti-inflammatory, immune-boosting, and anti-carcinogenic properties. The necessity for individualized approaches and careful observation is shown by the decreased bioactivity of methylation EGCG, the dangers of selenium excess, and the interactions between curcumin and everolimus. Additionally, the common consumption of supplements without medical oversight raises safety concerns,

especially for those with weakened immune systems. For optimal adoption of alternative nutrition, more reliable data, homogeneous ingredients, and improved cancer patients and oncologists are required.

Conclusion

Despite its great potential, the use of supplements and alternative nutritional approaches in cancer treatment is not without its challenges. Despite probiotics, vitamin D, oleuropein, green tea polyphenols, and other substances may improve treatment and reduce undesirable effects, their benefits will not be uniform for all individuals. Changes in pharmaceutical metabolism, diminished bioavailability, and a loss of control can all negatively impact treatment outcomes. The widespread, unmanaged supplementation usage by patients underscores the need for more comprehensive therapeutic guidance. Established practices, customized recommendations, and enhanced communication are necessary to ensure that supplements are utilized safely and effectively in combination with traditional medicines in oncology care.

Limitations

This review has a number of restrictions. Small sample sizes, short study periods, or the absence of placebo-controlled designs in several of the included studies limit the data' predictability. Because different studies have varied supplement formulas and dosages, it is difficult to compare results with accuracy. Differences in sorts of cancer, stages, and contemporaneous treatments further confound conclusions. The absence of reliable indicators for efficacy and safety further limits clinical translation. Furthermore, individual variations in genetics and microbiome that may influence a person's response to supplements were often disregarded. Due to these limitations, care should be used when using such outcomes in healthcare facilities.

Future Prospective

In order to clarify the safety, usefulness, and proper dosage of commonly used micronutrients in oncology, future research should focus on meticulously designed, comprehensive clinical trials. Exploring how inherited characteristics, such COMT alterations, that impact supplement responsiveness may help tailor care. Customized food strategies to improve immunological response and pharmaceutical benefit may potentially be made possible by microbiome analysis. It is necessary to create regulated supplement compositions with consistent quality and bioavailability. Digital health tools and platforms for tracking supplements may also improve safety monitoring and communication between patients and healthcare professionals. Closing the gap between clinical application and laboratory proof is still of utmost importance.

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