

Possible Integration of Natural Solutions to Support Cancer Patients

Christina Rahm*, M.S., Ph.D., Ed.D.

USA

Corresponding Author: Christina Rahm, M.S., Ph.D., USA.

Received: 📅 2024 Oct 11

Accepted: 📅 2024 Nov 22

Published: 📅 2025 Jan 10

1. Introduction

Natural treatments have been part of treatment strategies for centuries, and these valued commodities are identified for their potential health benefits. Natural remedies are essential for cancer treatment, where cells divide without stopping while spreading into other body tissues [1]. The diverse types of cancer, such as carcinomas, sarcomas, Leukemias, and lymphomas, can benefit from natural remedies. As such, this review highlights how cancer patients' benefit from various outcomes when natural ingredients like vitamins are included as part of surgery, radiation, chemotherapy and immunotherapy treatments. Current cancer treatments have their side effects, and natural remedies support patients by reducing or mitigating these side effects. For example, a study by Singh et al. indicated that plants, vegetables, and marine natural products have a therapeutic and preventive role in breast carcinoma" (2020, p. 5). Natural remedies for cancer are identified for their efficacy and affordability compared to synthetic chemo-therapeutic medications [2]. Improving the quality of life and prognosis of patients with cancer is of paramount significance, considering the damaging effects chemotherapeutic medications have on individuals [3]. Therefore, the purpose of this literature review is to assess the various natural remedies that are integrated with cancer treatment or in isolation to improve quality of life and prognosis of cancer patients.

1.1. Natural Remedies Integrated with Cancer Treatment

Natural remedies will continue to impact cancer treatment, as noted by since natural remedies are valuable reservoirs of novel bioactive entities [4]. Cancer treatment research shows that from 1940 to 2010, 175 anti-cancer therapies have been developed [5]. Out of the total number, 48.6% of these drugs have natural origins or are from natural products [5]. Currently, natural drugs that are in clinical trials for the treatment of cancer are the highest at 67 to 70 [4]. The use of natural remedies exists in written documents from old human civilizations, and the Sumeria Clay tablets contained various remedies. For instance, garlic has long been used to treat heart conditions [6]. Modern medications are developed based on scientific knowledge, although this knowledge is also based on ancient skills in medicine. Natural remedies show remarkable chemical and structural variety with more robust oxygen atoms and molecular weights, which increase binding attributes to create new chemical entities. Not only

are natural remedies less prone to bioactivity, but they are also effective for drug production due to their protein binding attribute [4]. There are two ways in which natural remedies are developed to become effective therapies. That one is the chemical-driven method, where researchers evaluate the biological activities of the compounds in remedies. Equally, the bioassay-guided process is a process in which practitioners and researchers use crude extracts, making it the biological-driven method. However, for this research, the processes by which the natural product is created are not selected, as the purpose is to evaluate the different varieties of natural remedies that support cancer treatment.

1.2. Nutraceuticals Remedies

Fat and water solution vitamins are used as supplements to increase immunity and reduce the side effects of illness and cancer. Nutraceuticals are products derived from food sources that are beneficial to the body and include vitamins. Vitamin C is an antioxidant associated with pro-oxidant influences, which can support the death of cancer cells [7,8]. In vitro studies conducted with vitamin C on patients show cancer cell apoptosis due to the molecular pathways contributing to apoptosis [9]. A systematic review of randomized control trial (RCT) studies showed that vitamin C is intravenously administered but not given orally and showed that there was a positive trend in some studies against cancer. However, the studies did not show effective results for group comparisons [10]. A systematic review evaluating various nutraceuticals showed that vitamins C and D were effective for cancer treatment. However, the effect of vitamin C was not evident during the follow-up trial period, meaning it would have had a possible late effect on cancer [11]. Concerning vitamin E used for cancer patients, a review of RCTs showed that vitamin E was used in combination with other treatments or one, and some studies suggested an adverse effect of the vitamin [12]. Thus, a large prospective study is needed to get better findings on the use and limitations of vitamins and how to indicate them. A systematic review examining the effect of vitamin D3 through RCTs showed that there was a reduction in the incidence of cancer and, hence, a better prognosis for people with average weight but no reduction among the overweight and obese. As such, increased weight risk is a consideration to note, as the prognosis may be less desirable for obese patients despite the intervention.

Chemotherapy is one of the primary medical treatments used in cancer. While the goal of therapy is to prolong life and support prognosis, these treatments have a severe impact on normal cells, and side effects can result in severe outcomes that negate the benefits of survival. For example, colon cancer patients complain of general weakness, diarrhea, nausea, vomiting and malaise. Thus, nutraceuticals such as vitamins are essential for reducing the effects of chemotherapy. Thus, recent studies affirm the use of high-dose intravenous vitamin C and K with other standard chemotherapy (chemo) therapies for mitigating the toxic side effects of chemo [13,14].

Effectively, it is essential to note that there are challenges in developing robust RCTs for evaluating vitamins, even though nutraceuticals show augmented prognosis quality for cancer patients, as vitamins reduce pain and protect normal tissues from toxicity [15]. These challenges arise since it is hard to patent vitamins, some clinicians have a bias against vitamin C, and the mechanisms of vitamins are not yet precise, which complicates pharmacodynamics [15]. For example, the use of folic acid on cancer patients which is a water-soluble vitamin has showed significant increase in frequency effect on the experimental group over the control group [16]. Understanding the effects of these vitamins and multivitamins in the treatment of cancer is critical since at high doses vitamin D leads to Vitamin D has potential harms, risk of hyperkalemia and kidney stones. Equally, there is a risk of reduced bone density with vitamin A. Considering the benefits and the concerns in this area, more research and collaboration between practice and research is needed to make efforts towards clarifying the benefits and limitations of vitamins.

Trace minerals are also essential, although they are needed in small amounts in a body and include chromium (Cr), iron, manganese (Mn), copper (Cu), iodine (I), zinc (Zn), cobalt (Co), Cadmium (Cd), fluoride (F) and selenium (Se). Thus, this review also includes a review of trace minerals for cancer treatment, although this review limits the review of macro minerals such as calcium and magnesium. For example, some studies have shown that there is a significant impact of inhibition for colon cancer due to the use of trace elements. The results of a study showed positive effects when Cd, Cr, Cu, Mn, and Zn were increased for metastasis patients, although Se was not increased [17].

The reason for applying trace elements is that they have a severe impact on biological processes as they bind with molecules. Imbalances of trace elements have been noted in some illnesses, including cancer and autoimmune diseases, as well as neurological disorders [17]. When trace elements accumulate rapidly or are deficient in the body, it can lead to the development of various cancers, such as colon and lung cancers. Therefore, even though trace minerals only play a 0.02% role in the body, they are significant causative or risk factor agents [18]. Mental processes interact with the biological systems since magnesium is essential in the phosphorylase. At the same time, the xanthine oxidase ratio requires a ratio of 8:1:4. Cancer is mitigated by various

factors such as copper and selenium, which play critical roles in limiting lipid oxidation, which can lead to chronic illnesses and advanced aging [18]. Thus, trace minerals play significant roles in supporting cancer patients from illness, and natural remedies should be evaluated by balancing with the needs of each patient.

Some studies have shown that trace minerals have been linked to varying degrees of lung cancer, primarily in RCT studies. Showed that some trace minerals that are in the body can be essential biomarkers for lung, breast, and colon cancer diagnosis [19]. Thus, there is a need for targeted recommendations based on population settings to minimize the impact of these minerals on public health. One RCT found that a per-unit increase in copper resulted in a higher lung cancer risk of up to 14% of lung cancer risk [20]. Equally, non-Hodgkin's lymphoma is a fast-growing cancer, and the imbalance in trace mineral concentration can cause an increase in disease progression [21]. Studies show that there is a significant amount of copper in patients' blood and scalp hair [21]. However, emerging research shows that trace minerals can be helpful in the treatment of non-Hodgkin's lymphoma, which is, using selenium-related compounds as anti-cancer agents, especially for lymphoma treatment [22]. Specifically, there is a positive effect of using selenium as an antioxidant and for promoting anti-inflammatory activities with minimum side effects.

1.3. Example Case Study: Colon Cancer

A 69-year-old patient with no history of colon cancer showed a lesion after an abdominal ultrasound, and a further test with a colonoscopy revealed an adenocarcinoma sigma. The patient was a recipient of surgery targeting the adenocarcinoma, and eight chemotherapy sessions followed. During one of the control examinations, there was an enlarged lymph node, which appeared metastatic, although the client objected to a histological examination. During the chemotherapy, the patient complained of general weakness, diarrhea, nausea, vomiting, and malaise. The laboratory (lab) results showed high white blood cell WBC (4, 8-10, 8 G/L) and high inflammatory parameter and liver enzyme levels. Therefore, various natural remedies were suggested, including four proprietary blends with various properties. For example, the first proprietary blend included 2x8 drops, morning and evening, for three days, then every three days, and then increased by 1-1 drops every three days to 2x10. Vitamin C was a critical aspect of this blend, along with silica and trace minerals. The effects of the proprietary blends were that the patient was feeling better, as noted by self-reports of reduced complaints and halted diarrhea and vomiting, which is the result of severe side effects of chemotherapy.

1.4. Phytochemicals

Various medicinal plants have been integrated into cancer treatment, and some studies have shown the significance of these plants in the treatment of cancer. However, some have also shown conflicting results in control studies [23]. The various plants that are used to produce benefits for cancer patients include green vegetables (kale, cabbage, parsley, spinach, aloe vera and broccoli). However, other

plants are also pertinent for the benefits they provide, such as apple fiber, green banana leaves, inulin, husk powder, and spirulina. Also, some fruits, such as pomegranate, coconut oil powder, and blueberry powder, are dried and made into powder form. Spices are also relevant in this list as they play an essential role with other plants for treatment and prevention. Research shows that medicinal plants such as cumin and turmeric reduce the spread of colon and other cancers since herbal extracts mitigate the growth of cancers by inducing apoptosis or autophagy [24]. These plant-based remedies activate various signaling pathways that are essential for treatment along with other standard treatments, such as chemotherapy [24].

The effects of medicinal plants are based on the chemicals they release, which can augment various protein and cell cycle inhibitors. Thus, the progression of cancers can be stopped by medicinal plants that are used in combination with other treatments, which also prevent the severe side effects of chemotherapy.

1.5. Example Case Study: Lung Cancer

A 55-year-old female revealed she had no family history of cancer, although she has been smoking for the past twenty years. The patient's medical history revealed she had been infected with COVID-19 and that there was post-COVID-19 syndrome. After a CT was performed, there was a metastasis suspected due to the abnormal-sized right hila and mediastinal lymph nodes. Lung cancer begins in the lymph nodes, although it tends to progress to other body parts, including the brain. The PET CT confirmed metastatic adenocarcinoma. The patient was diagnosed with Stage IV Non-small Cell Lung Cancer, and part of the palliative treatments included natural remedies as the patient complained of nausea, diarrhea, extreme weakness, loss of appetite and dyspnea. The patient was given six proprietary blends due to the severity, and one of the blends was proprietary blend five, which included phytochemicals such as inulin and alfalfa and green vegetables such as broccoli and spinach. The blend was given as one teaspoon in the evening for three days, which was later increased to one teaspoon in the morning and evening. The results of these six blends she got showed improvements in some symptoms, such as a general reduction of complaints socially since the vomiting and diarrhea stopped. Also, there was a decrease in fatigue and dyspnea and an improvement in appetite and chest pumping, which was provided in high-frequency intervals.

1.6. Remedies for Drug Delivery Functions: Silica Nanoparticles

Nanoparticle-based therapies have become more prominent after the COVID-19 virus, as they are used to develop mRNA vaccines. Silica nanoparticles are multifunctional delivery carriers in various functions, including drug delivery. The significance of plant-based synthesis of nanoparticles using rice husks is that it promotes environmental positive benefits. Rice husks have vast amounts of silica, which can be used as nontoxic nanoparticles for the delivery of drugs in cancer treatment as silica is known for low toxicity

levels and is an effective product that can also be found in sugarcane bagasse and is known for its attribute to promote electrolyte penetration [25, 26]. The significance of silicon in cancer treatment and all treatments is that some therapies, such as chemotherapy, have high toxicity levels while some treatments, such as zinc, while being an effective anticancer treatment, show rapid degradation in the bloodstream and may fail to reach the target [27,28]. Silica is an essential product to consider when there is a threat of various cancers, such as triple-negative breast cancer, which are aggressive and with few therapeutic alternatives since there is already a lower response from hormonal therapy [27,28]. Mesoporous silica particles are biocompatible and have been noted in some studies to be vital for cancer treatment. Nanoparticles are most effective when surgery is impossible, metastases are problematic and modern therapies such as radiotherapy pose significant side effects [29]. Some of the drugs that can be delivered using plant-based silicon nanoparticles include anticancer drugs, including doxorubicin and 5-fluorouracil [26]. Thus, plant-based silica nanoparticles will impact biomedical and other fields due to the ability of this silicon to pose limited effects on the environment.

1.7. Integration of Additional Natural Remedies

The function of B Nicotinamide Adenine Dinucleotide (NAD+) is not just DNA repair but also modulates gene expression and enables inflammatory responses and apoptosis [30]. Quercetin belongs to a group of plant pigments and is also pertinent in cancer treatment for mitigating free radicals that can annihilate cell membranes [23,31]. The effect of Quercetin is also to assess particles in the body that can cause cell death and mess with the DNA. Quercetin is helpful in reducing swelling and killing cancer cells and is thus an essential natural treatment [32,33]. As such, this research highlights the significant role of natural treatment that improves the quality of life and prognosis after treatment and is combined with standard cancer treatments or used alone.

1.8. Example Case Study

A 52-year-old female patient came with various symptoms, such as swollen lymph nodes in the neck and all over her body. From her family history, no one had been diagnosed with non-Hodgkin's lymphoma. She had been diagnosed with non-Hodgkin lymphoma (histological dg: low-grade, follicular) in 2021. A PET scan revealed multiple involvements. From her previous visit, the swollen lymph nodes had increased to more places, which are accompanied by persistent fatigue and night sweats. The patient's natural remedies included six blends, among them proprietary blend six, which included B Nicotinamide Adenine Dinucleotide (NAD+), magnesium, trace minerals, quercetin, vitamins C, D and K2. The blend was given for seven days, one each in the morning and evening, after which was followed by two diseases in the morning and evening. The purpose of the blend was to provide an immune shield, and after one month, the patient did not experience nausea, or night sweats. There has been a reduction of swelling of lymph nodes, and no new swellings emerged.

2. Conclusion

This research explored some of the natural remedies that are integrated with standard cancer treatment, such as chemotherapy. These natural treatments are grouped into four types, including phytochemicals, drug delivery functions, nutraceuticals and others such as B nicotinamide, adenine dinucleotide (NAD⁺), and quercetin. The significance of natural remedies is that they help to improve the quality of life due to the toxicity levels that accompany cancer standard treatments. These treatments can also be used in isolation to treat cancer-related cases. Notable benefits have been identified by using these natural treatments. However, more collaboration between researchers and practitioners is needed to find a balance that is most effective for patients. To demonstrate how these treatments are used in settings, three case studies have been included with specific examples of natural blends used in treatments.

References

- World Health Organization. (2023). *Cancer*.
- Mitra, S., Dash, R. (2018). Natural products for the management and prevention of breast cancer. *Evidence-Based Complementary and Alternative Medicine*, 2018(1), 8324696.
- Laskar, Y. B., Lourembam, R. M., Mazumder, P. B. (2020). Herbal remedies for breast cancer prevention and treatment. *Medicinal plants-use in prevention and treatment of diseases*.
- Mushtaq, S., Abbasi, B. H., Uzair, B., Abbasi, R. (2018). Natural products as reservoirs of novel therapeutic agents. *EXCLI journal*, 17, 420.
- Gurnani, N. M. D. G. M. M. B. K., Mehta, D., Gupta, M., Mehta, B. K. (2014). Natural products: source of potential drugs. *Afr J Basic Appl Sci*, 6(6), 171-186.
- Kong, J. M., Goh, N. K., Chia, L. S., Chia, T. F. (2003). Recent advances in traditional plant drugs and orchids. *Acta Pharmacologica Sinica*, 24(1), 7-21.
- Chen, Q., Espey, M. G., Krishna, M. C., Mitchell, J. B., Corpe, C. P., et al (2005). Pharmacologic ascorbic acid concentrations selectively kill cancer cells: action as a pro-drug to deliver hydrogen peroxide to tissues. *Proceedings of the National Academy of Sciences*, 102(38), 13604-13609.
- Chen, Q., Espey, M. G., Sun, A. Y., Lee, J. H., Krishna, M. C., et al (2007). Ascorbate in pharmacologic concentrations selectively generates ascorbate radical and hydrogen peroxide in extracellular fluid in vivo. *Proceedings of the National Academy of Sciences*, 104(21), 8749-8754.
- Irimie, A. I., Braicu, C., Pasca, S., Magdo, L., Gulei, D., et al (2019). Role of key micronutrients from nutrigenetic and nutrigenomic perspectives in cancer prevention. *Medicina*, 55(6), 283.
- Hoppe, C., Freuding, M., Büntzel, J., Münstedt, K., Hübner, J. et al (2021). Clinical efficacy and safety of oral and intravenous vitamin C use in patients with malignant diseases. *Journal of Cancer Research and Clinical Oncology*, 147(10), 3025-3042.
- Di Napoli, R., Balzano, N., Mascolo, A., Cimmino, C., Vitiello, A., et al (2023). What is the role of nutraceutical products in cancer patients? A systematic review of randomized clinical trials. *Nutrients*, 15(14), 3249.
- Donnelly, J., Appathurai, A., Yeoh, H. L., Driscoll, K., Faisal, W. et al (2022). Vitamin E in cancer treatment: a review of clinical applications in randomized control trials. *Nutrients*, 14(20), 4329.
- Böttger, F., Vallés-Martí, A., Cahn, L., Jimenez, C. R. (2021). High-dose intravenous vitamin C, a promising multi-targeting agent in the treatment of cancer. *Journal of experimental clinical cancer research*, 40, 1-44.
- Gul, S., Maqbool, M. F., Maryam, A., Khan, M., Shakir, H. A., et al (2022). Vitamin K: A novel cancer chemosensitizer. *Biotechnology and Applied Biochemistry*, 69(6), 2641-2657.
- Cantley, L., Yun, J. (2020). *Intravenous High-Dose Vitamin C in Cancer Therapy-National Cancer Institute. Natl Cancer Inst.*
- Wien, T. N., Pike, E., Wisløff, T., Staff, A., Smeland, S., et al (2012). Cancer risk with folic acid supplements: a systematic review and meta-analysis. *BMJ open*, 2(1), e000653.
- Islam, M. R., Akash, S., Rahman, M. M., Nowrin, F. T., Akter, T., et al (2022). Colon cancer and colorectal cancer: Prevention and treatment by potential natural products. *Chemico-biological interactions*, 368, 110170.
- Popescu, E., Stanescu, A. M. A. (2019). Trace elements and cancer. *Mod. Med*, 26, 169-175.
- Lossow, K., Schwarz, M., Kipp, A. P. (2021). Are trace element concentrations suitable biomarkers for the diagnosis of cancer? *Redox biology*, 42, 101900.
- Xian, W., Zhou, H., Zhang, Y., Shen, J., Liu, J., et al (2019). Blood trace minerals and lung cancer: a Mendelian randomization study. *Annals of Oncology*, 30, ix152.
- Qayyum, M. A., Shah, M. H. (2019). Disparities in the concentrations of essential/toxic elements in the blood and scalp hair of lymphoma patients and healthy subjects. *Scientific Reports*, 9(1), 15363.
- Golla, U., Dallavalasa, S. (2022). Chemopreventive Effects of Selenium and Selenocompounds in the Treatment of Lymphoma. *BioMed*, 2(3), 310-327.
- Gaobotse, G., Venkataraman, S., Brown, P. D., Masisi, K., Kwape, T. E., et al (2023). The use of African medicinal plants in cancer management. *Frontiers in Pharmacology*, 14, 1122388.
- Islam, M. R., Akash, S., Rahman, M. M., Nowrin, F. T., Akter, T., et al (2022). Colon cancer and colorectal cancer: Prevention and treatment by potential natural products. *Chemico-biological interactions*, 368, 110170.
- Zarei, V., Mirzaasadi, M., Davarpanah, A., Nasiri, A., Valizadeh, M., et al (2021). Environmental method for synthesizing amorphous silica oxide nanoparticles from a natural material. *Processes*, 9(2), 334.
- Prabha, S., Durgalakshmi, D., Rajendran, S., Lichtfouse, E. (2021). Plant-derived silica nanoparticles and composites for biosensors, bioimaging, drug delivery and supercapacitors: a review. *Environmental chemistry letters*, 19(2), 1667-1691.
- Chen, S., Greasley, S. L., Ong, Z. Y., Naruphontjirakul, P., Page, S. J., et al (2020). Biodegradable zinc-containing mesoporous silica nanoparticles for cancer therapy. *Materials Today Advances*, 6, 100066.

28. Chandler, P. D., Chen, W. Y., Ajala, O. N., Hazra, A., Cook, N., et al (2020). Effect of vitamin D3 supplements on development of advanced cancer: a secondary analysis of the VITAL randomized clinical trial. *JAMA network open*, 3(11), e2025850-e2025850.
29. Mohamed Isa, E. D., Ahmad, H., Abdul Rahman, M. B., Gill, M. R. (2021). *Progress in mesoporous silica nanoparticles as drug delivery agents for cancer treatment. Pharmaceutics*, 13(2), 152.
30. Navas, L. E., Carnero, A. (2022). Nicotinamide adenine dinucleotide (NAD) metabolism as a relevant target in cancer. *Cells*, 11(17), 2627.
31. Singh, P., Arif, Y., Bajguz, A., Hayat, S. (2021). The role of quercetin in plants. *Plant Physiology and Biochemistry*, 166, 10-19.
32. Singh, N., Kushwaha, P., Gupta, A., Prakash, O. (2020). Recent advances of novel therapeutic agents from botanicals for prevention and therapy of breast cancer: an updated review. *Current Cancer Therapy Reviews*, 16(1), 5-18.
33. Vafadar, A., Shabaninejad, Z., Movahedpour, A., Fallahi, F., Taghavipour, M., et al (2020). Quercetin and cancer: new insights into its therapeutic effects on ovarian cancer cells. *Cell bioscience*, 10, 1-17.