A review of complementary and alternative medicine used in cancer care: challenges and prospects

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Abbreviations
CAM, complementary and alternative medicine.

Citation

Abstract
Cancer is a leading cause of death globally, and most patients with cancers frequently seek for complementary and alternative medicine (CAM) to ameliorate their condition. Some of the available CAM care include: acupuncture, aromatherapy, Ayurvedic medicinal drug, cannabis, chelation remedy, homeopathy, hypnotherapy, massage therapy, naturopathic medication, and conventional Chinese remedy amongst others. Despite the growing use of CAM, the evidence-base for its efficacy and safety is limited. Major challenges confronting the efficient deployment of CAM is lack of standardization and regulation; as well as the demand for more extensive studies to validate their safety and efficacy. Integrative oncology which is the combination of CAM and conventional cancer care is likewise complicated through the potential adverse interactions between CAM options and most cancers drugs. The article serves as a guide for healthcare providers and patients to determine how CAM can be safely integrated into the cancer care paradigm. Taking into account safety concerns, however, more studies need to be conducted to properly evaluate its efficacy. Ultimately, CAM can help cancer patients in achieving greater health and well-being.

Keywords: alternative medicine; cancer; care; challenges; prospects
Introduction

Cancer is a complex group of diseases characterized with uncontrolled increase in unusual cells anywhere in the body. These unusual cells are called tumor cells, malignant cells or cancer cells and can infiltrate different tissues and organs of the body (liver, lung, colon, breast, bone marrow, prostate glands, etc.), disrupting their normal feature and function. Globally, cancer remains a major cause of mortality with enormous burden on public health [1]. In 2018, cancer was responsible for an estimated 9.6 million deaths, making it the second leading cause of death worldwide after cardiovascular disorders, despite the great advances in cancer research and treatment [2]. The burden of cancers is expected to continue to push upward due to numerous factors, which include population explosion, old age, and lifestyle including imbalance diets, sedentary life, alcohol consumption and tobacco use [1].

Besides mortality, the impacts of cancer also include morbidity and decreased quality of life. Standard cancer care is expensive and often requires specialized healthcare assets, which may be lacking in resource-limited countries. The financial burden of cancer can also be enormous, as it affects, not only the patients, but as well as their families, communities and society at large. Cancer has significant devastating emotional toll on sufferers and their households. The mental impact of cancer diagnosis and prognosis on sufferers and their family members have been documented [3].

While traditional cancer treatments (chemotherapy, radiation and surgery) have made substantial advancement in the treatment and management of most cancers [4], many cancers patients yet seek complementary and alternative medicine options to support their conventional cancer therapy [5, 6].

Complementary and alternative medicine (CAM) refers to a large range of healthcare practices and products that are not taken into consideration as part of standard treatment; however are used in conjunction with or in place of conventional treatments to enhance the quality of life of cancer sufferers [7–9].

Historically, CAM has been used for centuries to address diverse health challenges including cancer [10]. And despite the controversy surrounding their use, cancer sufferers have persevered to seek CAM for a whole lot of reasons. Some want to supplement their traditional treatment with alternative treatments to alleviate symptoms including headache, nausea, fatigue, and anxiety, or to alleviate adverse outcomes associated with some cancers drugs. Others also seek for CAM because they are dissatisfied with the unexpected outcomes of conventional remedy or because they consider that CAM can offer a lasting solution to their condition. Still a few use CAM to reinforce the body’s immune system to fight cancer [5, 6]. CAM encompasses a wide variety of treatments, which include acupuncture, natural remedy, meditation, and dietary supplements. While a few CAM practices and products have not been proven to be effective and safe, some have been proven to be promising in cancer treatment. Still, others have been shown to be ineffective or even harmful [10, 11]. In this review, we explore a number of available CAM options, as well as the associated challenges and prospects.

Complementary and alternative medicine options for cancer care

Some of the available CAM options for cancer patients include acupuncture, aromatherapy, Ayurvedic medication, cannabis, chelation remedy, homeopathy, hypnotherapy, massage remedy, naturopathic medicinal drug, and traditional Chinese medicine among others (Figure 1) [7, 9, 11].

Acupuncture

Acupuncture is an historical Chinese exercise that involves putting tiny needles into unique points on the body. The aim of acupuncture is to balance the body’s energy, and promote recovery. Some humans use acupuncture to alleviate the side effects of cancer treatment, which include nausea, pain, and fatigue. Several researches have shown that acupuncture may be effective in treating cancer-related symptoms. A systematic evaluation of 29 randomized controlled trials found that acupuncture was powerful in lowering chemotherapy-precipitated nausea and vomiting. Another research observed that acupuncture turned into be extra powerful than standard care in lowering the severity of warm flashes in breast cancer survivors [12–16].

Aromatherapy

Aromatherapy deals with the use of essential oils from plants to achieve restoration and wellness. Essential oils can be inhaled, rub topically, or used in a diffuser. Some people use aromatherapy to alleviate the facet effects of cancer remedy, which includes anxiety, nausea, and ache. There is no enough studies on the effectiveness of aromatherapy in treating most cancers-associated signs. However, a few researches have shown that essential oil may be useful. For example, a randomized controlled trial discovered that breathing in peppermint oil reduced chemotherapy-triggered nausea and vomiting. Another study discovered that a mix of essential oils decreased emotional tension and improved the quality of life of patients with terminal cancer [16–19].

Figure 1 Complementary and alternative medicine for cancer care. CAM, complementary and alternative medicine.
Ayurvedic medicine

Ayurvedic medicine is a traditional Indian system of medication that emphasizes the stability of body, mind and spirit to improve fitness and health. Ayurvedic medicine for cancer includes herbs, weight-reduction plan and changes of way of life, and detoxification cures. There is scarcity of medical evidence in support of Ayurvedic medicine for the treatment of most cancers. However, a few researches have proven that certain herbs used in Ayurvedic medicine have anti-cancer activities. For example, curcumin, a compound in turmeric, has been proven to inhibit the development and spread of cancer cells in laboratory research [6, 9, 20].

Cannabis remedy

Cannabis, also referred to as marijuana, is a plant this is used for medicinal and recreational functions. Some cancer patients use cannabis to relieve the facet outcomes of cancer remedy, together with nausea, ache, and loss of appetite. There is limited clinical evidence to prove the effectiveness of cannabis in the treatment of cancer. However, a few studies have proven that cannabinoids, the active compounds in cannabis, can inhibit the development and spread of cancer cells in laboratory studies. A randomized controlled trial observed that a mixture of delta-9-tetrahydrocannabinol and cannabidiol, two cannabinoids found in cannabis, produced a better outcome than placebo in relieving cancer-associated pain [16, 21].

Chelation remedy

Chelation remedy is a remedy that involves the infusion of chelating agents (like dimercaptosuccinic acid and ethylene diamine tetra-acetic acid) to remove heavy metals from the body. Some patients use chelation remedy as an alternative cancers remedy, believing that heavy metals are a contributing factor to cancer. So far, there is no medical proof that shows that chelation therapy can help treat cancer. In fact, chelation therapy can be dangerous and has been known to cause serious problems, like kidney damage and even death [22, 23].

Homeopathy

Homeopathy is a type of remedy that uses super-diluted substances to trigger the body's own natural healing abilities. Some patients with cancer seek homeopathy with the aim of enhancing their immune system in order to combat the disease. However, there is no clinical evidence to support the usage of homeopathy in the treatment of cancers. In fact, the effectiveness of homeopathy for any health condition has been queried by many health specialists. A meta-analysis of 225 studies on homeopathy found no evidence in favor of the use of homeopathy for cancer treatment or management [9, 24].

Hypnotherapy

Hypnotherapy is a type of therapy that makes use of hypnosis to help patients relax and focus their minds. Some people use hypnotherapy as a complementary therapy to relieve the facet outcomes of cancer remedy, such as emotional tension, ache, and fatigue. However, studies supporting the effectiveness of hypnotherapy in treating cancers-associated signs and symptoms are scarce. However, a few researches have shown that hypnotherapy can be useful. For instance, a randomized controlled trial found out that hypnotherapy decreased anxiety and improves quality of lifestyles in breast cancer patients receiving radiotherapy [16, 25, 26].

Massage therapy

Massage therapy is a type of therapy that entails the manipulation of soft tissue to enhance relaxation and recovery of the individual. Some patients use this therapy to relieve themselves the side effects of cancers medications, such as body ache, emotional tension, and fatigue. Several studies have proven that massage therapy can be powerful in treating cancers-associated signs. A systematic evaluation of 16 randomized controlled trials discovered that massage therapy effectively reduced cancers-related pain, improved quality of life and reduced anxiety in cancers sufferers [16, 27].

Naturopathic medicine

Naturopathic medicine is a system of medicine that makes use of natural healing procedures, along with herbs, vitamins, and nutrients, to enhance health and fitness. Naturopathic treatments for cancer consist of nutritional and life-style modifications, natural medicine, and acupuncture. However, there is limited medical proof to validate the effectiveness of naturopathic medicine the treatment of cancer. However, a few studies have shown that certain herbs utilized in naturopathic medicine have anti-cancer activities. For example, milk thistle has been shown to inhibit the growth of cancers cells in laboratory investigation [9, 28, 29].

Traditional Chinese medicine

Traditional Chinese medicine is a system of medical practice that has been used in China for over 2,000 years. Traditional Chinese treatments for cancer encompass the use of herbal remedies, acupuncture, and nutritional and lifestyle adjustments. There is also limited clinical evidence to validate the usage of traditional Chinese medicine for the treatment of most cancers. However, a few research have shown that certain herbs utilized in traditional Chinese remedy have anti-cancer virtues. For example, astragalus has been shown to stimulate the immune system and inhibit the proliferation of cancer cells in laboratory studies (Table 1) [9, 30].

Challenges in applying complementary and alternative medicine in cancer care

Some of the difficulties and challenging situations confronting the usage of CAM for cancer care include: lack of scientific evidence supporting its efficacy, lack of regulation and standardization, potential risks and adverse effects amongst others [31].

Lack of clinical evidence supporting its effectiveness

One huge problem with the usage of CAM for cancer care is that there are no much scientific evidences to validate that they truly work. Some CAM remedies have been evaluated in human subjects without any positive outcome, while others are yet to be sufficiently studied to verify whether or not they are secure or powerful. For instance, some natural supplements may get on the way of chemotherapy or radiation treatment, while others are helpless in the fight against cancer growth and development. To cope with this challenge, researchers are making concerted efforts to carry out more clinical trials to validate the safety and effectiveness of CAM [23, 32, 33].

Lack of regulation and standardization

Another challenge of CAM in cancer treatment is the lack of regulation and standardization. Unlike conventional medicine, which is regulated by strict law and government agencies, many CAM are not regulated or standardized. This lack of law can make it tough for most cancers patients to recognize which curative procedures are safe and effective, and can also result in discrepancies in product quality and inconsistent dosing [34–36].

Potential dangers and side effects

Some CAM options can have potential risks and adverse outcomes, much like conventional treatment. Still, the combination of alternative and conventional medicine remains a challenge. Some therapies may interact with conventional treatment in some negative ways, while others may have inherent harmful effects. For example, a few herbal remedies can be toxic at high doses or interact with prescription medicines [21, 23, 37, 38].

Individual variability

CAM therapies may work differently for different individuals. What works for one patient may not be effective for another, emphasizing the importance of personalized care and ongoing monitoring.
Integrative and CAM treatments are associated with threats when used in conjunction with conventional therapies. Many CAM treatments are non-invasive, safe, and have potential benefits, such as pain relief, stress reduction, and overall well-being. However, CAM treatments also have limitations, such as potential side effects, risks, and complications. It is important for patients to be educated about CAM treatments and their potential benefits and limitations.

**Table 1: The advantages and disadvantages of various CAM options used in cancer care**

<table>
<thead>
<tr>
<th>CAM option</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture</td>
<td>May be beneficial in managing cancer-related symptoms and chemotherapy side effects such as pain, nausea, and fatigue.</td>
<td>Limited scientific evidence to support its efficacy.</td>
</tr>
<tr>
<td></td>
<td>It is non-invasive.</td>
<td>Potential risks and complications.</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>Has the potential to promote relaxation, reduce stress, and improve overall well-being.</td>
<td>Limited scientific evidence to support its efficacy.</td>
</tr>
<tr>
<td></td>
<td>Easily incorporated into cancer care routines.</td>
<td>Certain essential oils may cause skin irritation and allergic reactions, particularly for individuals with respiratory issues.</td>
</tr>
<tr>
<td></td>
<td>It is non-invasive.</td>
<td><strong>Homeopathy</strong></td>
</tr>
<tr>
<td>Ayurvedic medicine</td>
<td>Some herbal formulations and dietary modifications may be beneficial in managing cancer-related symptoms.</td>
<td>Limited scientific evidence to support its efficacy.</td>
</tr>
<tr>
<td></td>
<td>May help improve overall well-being.</td>
<td>Quality control, regulation and safety concerns.</td>
</tr>
<tr>
<td>Cannabis</td>
<td>May help alleviate pain, nausea, and loss of appetite.</td>
<td>Potential interactions with conventional cancer treatments.</td>
</tr>
<tr>
<td></td>
<td>Provide potential support against chemotherapy-induced side effects.</td>
<td>Toxic levels of metals and other substances can also be found in some preparations.</td>
</tr>
<tr>
<td>Chelation therapy</td>
<td>Provides an avenue for the removal of heavy metals from the body, which may have accumulated on account of cancer treatments.</td>
<td><strong>Hypnotherapy</strong></td>
</tr>
<tr>
<td></td>
<td>Can be used to relieved pain and nausea.</td>
<td>Limited scientific evidence to support its efficacy.</td>
</tr>
<tr>
<td></td>
<td>It is non-invasive.</td>
<td>Highly diluted remedies, raising questions of effectiveness.</td>
</tr>
<tr>
<td></td>
<td>Personalized treatment based on symptoms.</td>
<td><strong>Massage therapy</strong></td>
</tr>
<tr>
<td></td>
<td>May help reduce anxiety.</td>
<td>Limited scientific evidence to support its efficacy.</td>
</tr>
<tr>
<td></td>
<td>Provide pain and stress relief.</td>
<td>Individual reactions can vary. Consequently, it may not be suitable for some patients, particularly those with mental health issues.</td>
</tr>
<tr>
<td></td>
<td>Generally safe when practiced by trained professionals.</td>
<td>Limited scientific evidence to support its efficacy.</td>
</tr>
<tr>
<td>Naturopathic medicine</td>
<td>Dietary changes, lifestyle modifications, and stress reduction techniques are likely to be included.</td>
<td>Need for trained and qualified therapists.</td>
</tr>
<tr>
<td>Traditional Chinese medicine</td>
<td>Employs holistic approach.</td>
<td>Techniques must be tailored to the individual patient’s needs and wellbeing.</td>
</tr>
<tr>
<td></td>
<td>Employs a range of practices such as acupuncture, herbal medicine, and dietary therapy. These can improve quality of life and overall well-being in cancer patients.</td>
<td>Caution is needed for individuals with compromised immune systems, bone metastasis or cancer itself.</td>
</tr>
<tr>
<td></td>
<td>Affords personalized treatment.</td>
<td>Limited scientific evidence to support its efficacy.</td>
</tr>
<tr>
<td></td>
<td>Has long history of use in managing different ailments.</td>
<td>Quality control and safety concerns.</td>
</tr>
</tbody>
</table>

CAM, complementary and alternative medicine.

**Patient safety and informed decision-making**

Healthcare providers must ensure that patients are well-informed about the potential benefits, risks, and limitations of CAM options. Patient safety should be prioritized, and CAM therapies should be used as complementary rather than alternative to conventional cancer treatments.

**Ethical considerations**

Healthcare providers need to navigate ethical considerations when discussing and recommending CAM options. It is important to provide evidence-based information, while respecting patients’ autonomy in decision-making.

**Prospects for complementary and alternative medicine**

Despite these challenges, the use of CAM cancer care is promising. For example, a few studies have discovered that acupuncture can be used to alleviate cancers-related ache and nausea, whilst others have proven that meditation can improve quality of life and wellness for cancer patients. Some herbal dietary supplements have also shown promise in reducing the adverse effects associated with radiation therapy and chemotherapy. Additionally, nutritional supplements together with vitamin D and omega-3 fatty acids were found to be capable of reducing cancer threat. While some therapies have promising potential, more studies are needed to validate their safety and efficacy in cancer care [39, 40].

**Integrative oncology**

Integrative oncology is a notably new and quickly evolving discipline.
that combines conventional cancers treatment with complementary and alternative healing procedures to improve patients’ quality of life and wellness. The concept of integrative oncology is to use a comprehensive and holistic technique that takes into account the physical, psychological, social, and spiritual factors of most cancer care. Integrative oncology is turning into increasingly essential because of the limitations of traditional cancer remedy. While chemotherapy, radiation, and surgical procedure are a hit in dealing with cancer, they often come with unpleasant facet outcomes. Not to say, cancer treatment may be very tasking on sufferers’ emotional and intellectual health, affecting their overall health at the long run [41, 42].

Integrative oncology aims to overcome these challenges by using a customized method that focuses on the individual and not on the cancer. It consists of complementary treatments, such as acupuncture, massage, meditation, and yoga, to help alleviate side effects like ache, fatigue, and stress. Integrative oncology also consists of nutrition counselling and lifestyle interventions to improve patient’s total health and well-being [43].

One of the primary aims of integrative oncology is to enhance the quality of patient’s life by way of decreasing side effects, relieving signs and symptoms, and enhancing the body’s natural healing capability. Integrative oncology has been shown to improve the physical and emotional wellness of cancer patients, reduce signs and symptoms of anxiety, depression and stress [44]. Integrative oncology also can improve the effectiveness of conventional cancer treatments. For example, studies have shown that acupuncture can help lessen chemotherapy-induced nausea and vomiting, while massage remedy can alleviate ache and fatigue. Mind-body interventions like meditation and yoga were shown to improve the performance of the patient’s immune system in response to cancer treatment [45].

Another important area of integrative oncology is its recognition of the survivorship. Many cancer survivors experience ongoing physical, emotional, and social stresses after finishing cancer treatment. Integrative oncology can offer ongoing help to assist survivors maintain their physical and emotional fitness, manage symptoms, and prevent cancer recurrence. Overall, integrative oncology is an important and unexpectedly growing area that has the ability to improve the quality of life and wellbeing of cancer patients. By incorporating complementary and alternative remedies into conventional cancer care, integrative oncology gives a greater comprehensive and holistic technique to cancer remedy that addresses the physiological, psychological and spiritual needs of the patients [46, 47].

Conclusion
Cancer remains a global health concern of the 21st century with high morbidity and mortality, and there are many CAM which are being used to treat this disorder. While CAM offer a few benefits for cancer sufferers, it is critical to be aware that they are no alternatives for conventional cancer treatments. Patients need to consult with their healthcare providers before subscribing to the use of any form of complementary and alternative medicines. More also, some CAM products and procedures may have side effects or affect the normal activities of conventional drugs, it is therefore needful for them to discuss with their healthcare vendors before receiving any form of CAM. While more research is needed to validate the potency and safety of CAM, they may offer additional support to cancer patients, but by no mean serve as a replacement or substitute for conventional medicines. It is important for patients to work with their healthcare givers to decide on the most appropriate treatment plan for their personalized needs. Healthcare givers play an important role in supporting cancer sufferers who use CAM. They can help sufferers make knowledgeable choices on the proper use of CAM and screen for any attending adverse effects or interactions with conventional treatments. In conclusion, the importance of CAM options in cancer care cannot be overstated. Nursing staff must be well acquainted with CAM therapies, and collaborate with other healthcare providers to ensure safety and well-being of the patients. It is paramount for healthcare providers to prioritize patient safety and informed decision-making when it comes to CAM options. With that said, these therapies may help support and complement standard cancer care, allowing patients to make informed decisions around their health and well-being.

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