

MUSIC THERAPY FOR MANAGEMENT OF SYMPTOMS ASSOCIATED WITH CHEMOTHERAPY: SYSTEMATIC REVIEW*

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*This topic was presented at the Firth International Conference "Health Care - A contribution to the Quality of Life" on June 9-10, 2023.

Introduction and Aim: Chemotherapy used in the treatment of cancer causes many chemotherapy-associated symptoms, interruption of the treatment, reduction of dose, or modification of the chemotherapy protocol. Today, supportive treatment methods are used to manage these symptoms such as relaxation, music therapy, hypnosis, acupuncture, acupressure, meditation, massage, reflexology, cryotherapy, and aromatherapy. The purpose of this review is to systematically analyze current information and studies regarding the effects of music therapy in the management of symptoms associated with chemotherapy.

Material and methods: The literature review was done between 1 and 30 April 2020. The keywords of "cancer", "chemotherapy", "music therapy", and "chemotherapy side effects" were used for the literature review. The articles were searched via PubMed, Google Scholar, Cochrane, and Turkish Thesis Center databases. A total of 843 publications were reached. The number of studies related to the subject of the study was 314. Thirteen articles matching the study criteria were evaluated.

Results and discussion: Music therapy uses the therapeutic aspects of music. The literature review displays that music therapy is the clinical and evidence-based application of music for relieving the psychological and physiological effects of a disease or disability. Music reduces pain and anxiety, distracts attention, changes the perception of pain, improves the quality of life, and positively affects hormones such as serotonin, dopamine, adrenaline, and testosterone, decreases blood pressure, and respiratory rate, decreases cortisol secretion, increases secretion of immunoglobulin.

Conclusion: Music therapy supports patients emotionally and improves oxygenation and blood circulation. Nurses may encourage patients to listen to music for relaxation during chemotherapy.

Keywords: *Cancer, chemotherapy, music therapy*

Introduction

Cancer is the uncontrolled division and proliferation of cells in an organ or tissue. It is the second cause of death in the world and our country. According to GLOBOCAN 2018 data, the global cancer burden has increased to 18.1 million cases and 9.6 million people died due to cancer [1]. With the increase in the incidence of cancer types all over the world, the use of treatment methods such as chemotherapy and radiotherapy has increased [2]. Although these treatment methods cause the emergence of many

symptoms, they also reduce the quality of life [2, 3]. These symptoms are nausea-vomiting, anorexia, fatigue, dyspnea, mouth ulcer, constipation, diarrhea, bone marrow depression, insomnia due to sleep disturbance, depression, taste change, pain, alopecia, and anxiety [2, 4]. In addition, individuals with cancer have decreased social interaction, loneliness, anger, fear, changes in body image, hopelessness, guilt, family role changes, uncertainty, and rejection of the disease, helplessness, and physical, social, psychological, and economic problems that may develop after the operation [4]. Since the aforementioned symptoms are encountered too often, prevention of complications, early detection, and symptom control have become important [2]. The most common symptoms are nausea-vomiting, anxiety, pain, and insomnia [4]. Nausea-vomiting is seen in individuals with cancer between 20-30% in the initial stage and 60-70% in the advanced stage [5, 6].

The severity of the symptoms seen in patients due to chemotherapy disrupts the treatment protocol and negatively affects the quality of life. Today, many supportive treatments are applied to reduce or eliminate these negative effects of chemotherapy. These supportive therapies are called Complementary and Alternative Therapy (CAM) [3]. CAM methods can be listed as using herbal products, relaxation, hypnosis, acupuncture, acupressure, yoga, meditation, massage, music therapy, reflexology, cryotherapy, and aromatherapy [2, 7].

In this article, music therapy is discussed among the methods. According to Ibn Sina, music; is a mathematical science that investigates whether sounds are compatible with each other, the time that comes between these sounds, the processes, and how a melody is composed [8]. Music therapy, on the other hand, is the application of music by a health professional based on clinical evidence to help relieve the psychological and physiological effects of a disease or disability [1]. Music therapy is as old as medicine and is used in many fields. It is known that it is used to treat various diseases in different cultures [1, 9]. In Central Asia, the Turks used the music of the Baksi in the treatment of various diseases. The first use of music therapy is for analgesia and anesthesia. In history, Babylon, Egypt, Assyria, China, Egypt, and Greek civilizations used music for therapeutic purposes. The Greeks used music to treat physical and spiritual problems [9, 10]. Ibn-i Sina, Farabi, Zekeriya er Razi, and Ebubekir are both physicians and musicians. Farabi music maqams; Rast, rehavi, kuçek, büzürk, isfahan, neva, zirgüle, saba, buselik, huseyni, hicaz

makam. Sultan Beyazit Hospital, which was established in Edirne during the Ottoman period, was a psychiatric hospital where a certain authority was prescribed for psychological disorders [8, 9].

Today, music therapy is used to reduce in intensive care units, during radiotherapy and chemotherapy in oncology, before and after surgery, during childbirth, symptoms such as learning disability, substance abuse, Down syndrome, epilepsy, sexual abuse, AIDS, Parkinson, pain in palliative care, anxiety, nausea-vomiting, insomnia [1,9]. The purpose of the use of music therapy is to provide relaxation, increase comfort, reduce treatment-related stress, pain, depression, blood pressure, anxiety, and nausea-vomiting, and gain a sense of belonging to a group [1].

Music therapy is divided into two as active and passive. Active music therapy is done with dancing and rhythmic movements, singing songs, and using musical instruments. Passive music therapy: It is performed by listening to recorded or live music [1]. The therapeutic aspects of music are utilized in music therapy [1]. Rhythm, melody, and harmony are used for therapeutic purposes [9]. Music selection is very important. Not all music is effective for every disease [10]. The music played should be slow, soothing, and at a low volume [5]. The correct use and application of music is very important for it to have a positive effect on patients. In correct practice, important duties fall on the nurse [1,10]. In the study of Suna et al., it was concluded that 56% of patients receiving chemotherapy wanted to listen to music. Patients (38%) who wanted to listen to music preferred to listen to Classical Turkish Music and 32% to Turkish Folk Music [3].

Music has positive effects on the endocrine and nervous systems. It has been stated that it positively affects hormones such as serotonin, dopamine, adrenaline, and testosterone, decreases blood pressure, and respiratory rate, decreases cortisol release, increases immunoglobulin A release, and provides oxygen and blood supply balance in the brain. It is known that music reduces pain and anxiety, diverts attention, changes the perception of pain, and increases the quality of life of terminal patients [9, 10]. To cope with the symptoms after chemotherapy in gynecological oncology, patients were allowed to dream with music. It has been observed that the muscles of the patients relax and relax. Positive feedback was received from patients [10].

Sleep problems are seen for a long time in cancer patients. Predisposing factors in the etiology of sleep problems are cancer stage, pain, side effects of treatment, and poor

sleep hygiene. Sleep problems are 30-50% in new diagnoses, and this rate is higher in advanced cancers. It is more common in women than men. It is more common in young patients [4]. In studies, music played to children with pediatric oncology patients before and after chemotherapy reduced nausea and vomiting in children [11]. Nurses, who are constantly with patients, should inform patients about CAM practices and ensure that they make the right CAM selection for their symptoms. Nurses should be involved in the planning and implementation of CAM methods. In addition, nurses have researcher and consultant roles [5].

Method

The articles accessed in April 2020 using PubMed, Medline, Google Scholar, Cochrane, and National Thesis Center databases were searched. The screening was done using combinations of the keywords cancer, chemotherapy, music therapy, and chemotherapy symptoms. As a result of the search, 843 articles were found. The number of studies related to the subject of the study was 314. From the scanned publications, 13 articles matching the study criteria were evaluated (Figure 1: PRISMA 2009 Flow Diagram).

The titles and abstracts of the articles determined as a result of the literature review were evaluated by the researchers at different time intervals and independently of each other, taking into account the inclusion criteria. If the title or abstract part is not clear, the full text of the research has been examined. The evaluation results of the researchers were compared by entering the data summary form and the ones compatible with the subject were obtained. Researchers have written in the data summary form; the date of the research, by whom it was made, where it was published, the full title of the research, the summary, and the results (Table 1).

Data Collection Tools

The 27-item PRISMA Statement Form, which was developed to determine the reporting characteristics of the articles, was used to obtain the data. The evaluation questions in this form are listed according to the sections that should be included in the systematic review: Title (item 1s, Abstract (item 2), Introduction (items 3, 4), Methods (items 5, 6, 7, 8, 9, 10, 11). , 12, 13, 14, 15 and 16), Results (items 17, 18, 19, 20, 21, 22 and 23), Discussion (items 24, 25 and 26), and funding sources (item 27).

While evaluating the data, information about the characteristics of the articles (authors, publication year, focus of the review, number of studies included in the reviews- design types of the studies, databases used, and guidelines used) were examined. The PRISMA Statement is an updated guide from the QUOROM statement developed by the international group in 1996 to evaluate the reporting characteristics of systematic reviews. The guide is in the form of a checklist and the response options are "Yes=1 point", "No=0 point" and "not applicable". Before the data collection process, the articles of the PRISMA Statement were tested by the researchers for clarity with pilot evaluations. The articles included in the research were evaluated independently by the researcher using the PRISMA Statement Form, between 0-27 points.

Analysis of Data

The PRISMA Statement was used to evaluate the compliance of the review articles with scientific principles. According to this evaluation, the articles were scored (in terms of title, abstract, introduction, method, conclusion, discussion, and funding). The status of each item meeting the information in the evaluated article was evaluated, and it was evaluated as "1 point" if it was fully compatible, and "0 point" if it was not [12]. In this study, some articles (items 13, 16, 20, and 23) of the PRISMA Statement were evaluated as "not applicable", as some items that generally included measurements in meta-analysis studies were not appropriate. The total score required from the PRISMA Statement is 27. In this study, the total score required for reporting quality is 23, since 4 items considered "not applicable" were not included in the evaluation. Number, percentage, mean and standard deviation were used in the analysis of descriptive data. For the assessment tool PRISMA Statement, interobserver consistency was assessed by Cohen's Kappa analysis. In the evaluation of the fit, as Kılıç stated in his article, "0.0-0.20 poor fit", "0.21-0.40 reasonable", "0.41-0.60 moderate", "0.61-0.80 good" and "0.81-1.00 very good fit" were used. The significance value was accepted as $p = 0.05$ [13].

Findings and Discussion

In cancer types, some symptoms occur due to the disease process and limit the life of the patients as a result of the treatments applied. In addition to medical treatment, CAM applications are also applied to patients to enable them to cope with these symptoms that are physically, psychologically, socially, and economically challenging. Patients have different reasons for using CAM. The quality of life of individuals decreases due to the

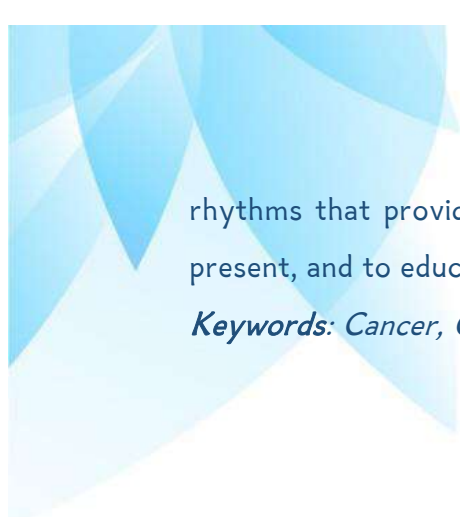
side effects of the treatments related to the disease process. Music therapy is used for reasons such as improving the emotional state of patients, strengthening the immune system, reducing pain and anxiety, increasing sleep quality, reducing the side effects of treatments, and providing well-being in the body [14]. Various studies have been carried out by different researchers to understand the effect of music therapy on symptoms in this area. Music therapy results applied to patients receiving chemotherapy are as follows:

According to the study of Yıldıırım and Gürkan; anxiety levels of patients who are treated with music therapy decrease [15]. It has been concluded that music therapy can reduce the length of stay in the hospital after radical mastectomy and improve depression in patients with breast cancer [16].; It has been reported that music increases patients' quality of life, well-being, and relaxation, reduces tension, and reduces sleep, fatigue, pain, and anxiety in breast cancer patients [6]. Gökalp's study concluded that in elderly cancer patients, music therapy reduces the level of anxiety and increases sleep patterns [8]. One research reported that the anxiety score of the experimental group was 6.28 ± 5.75 before music therapy, it was 3.52 ± 4.04 after music therapy. The decrease in anxiety scores was found significant compared to pre-music therapy. The sleep quality of patients with breast cancer increased after music therapy [1]. Burns (2001) in his study with cancer patients; reported that patients' muscles relax and relax while listening to music. It has been determined that a decrease in cortisol secretion leads to an increase in immunoglobulin A secretion [10]. The undesirable music played during chemotherapy did not cause a change in the quality of life It has been reported that the music effect interacts significantly with the age of the patient, and after the musical intervention, insomnia and appetite loss scores improved in patients over the age of 45 [4].

Conclusion and Recommendations

Music therapy reduces anxiety, fatigue, and pain, increases sleep quality, provides relaxation, can reduce the length of stay in the hospital, reduces nausea-vomiting and depression, and improves mood disorders. Music therapy has a great contribution to the reduction of symptoms in addition to medical treatment. It improves the quality of life of patients.

It is recommended to benefit from the effects of music therapy in chemotherapy, radiotherapy outpatient or inpatient wards where patients are treated, to select the



rhythms that provide relaxation and to play this music in the areas where patients are present, and to educate health workers about the effects of music therapy on symptoms.

Keywords: *Cancer, Chemotherapy, Music therapy.*

Table 1. Summary of manuscripts in the current systematic reviews

no	Manuscripts	Year/ Country	Design	Journal	Aim	Sample	Data collection	Results
1	The influence of music on anxiety and the side effects of chemotherapy [15]	Yıldırım, S., & Gürkan, A. (2007). Turkey	Experimental	Anadolu Psikiyatri Dergisi	This research aims to examine the effect of music on chemotherapy side effects and anxiety levels.	60	State-Trait Anxiety Inventory, Cancer Symptoms Inventory, and Chemotherapy Side Effects Inventory	There was a statistically significant decrease in average sleep quality scores and anxiety scores of the intervention group after music therapy ($p < 0.001$).
2	Effects of music therapy on anxiety and sleep quality of patients with breast cancer [1]	Türüng Bobar, F. (2019). Turkey	Cross-sectional, Controlled, and Experimental		This research aims to determine the anxiety levels and sleep quality of patients with breast cancer and to evaluate the effect of music on the sleep quality and anxiety levels of these patients.	49	Data Collection, Pittsburg Sleep Quality Index (PUKI), Hospital Anxiety and Depression Scale	There was no statistically significant difference between the pretest Pittsburgh Sleep Quality Index and State-Trait Anxiety Inventory mean scores of the experimental and control groups. Pittsburgh Sleep Quality Index and State-Trait Anxiety Inventory mean scores of the experimental group were lower than the control groups. The intervention of music therapy was found to have an effect in reducing anxiety and increasing the sleep quality of patients. Music therapy can be used as an alternative method of treating anxiety and increasing the sleep quality of geriatric hematology patients.
3	Healing effects of sound and music on the organs [9]	Karamızrak, N. (2014). Turkey	Review	Koşuyolu Heart Journal	In this article, the effect of sound and music on our health in medical treatments has been tried to be emphasized.			Studies show that music therapy is an effective method in reducing the severity of pain and anxiety levels in patients. Sound and music therapy is a painless, safe, and side-effect-free treatment method that can be used in all areas of health.
4	Alternative application for side effects of gynecologic cancer treatment [7]	Taşçı Duran, E. (2011). Turkey	Review	S.D.Ü. Tıp Fak. Dergisi	This article has been compiled to reflect a general evaluation of alternative therapies used for the side effects of cancer treatments.			CAM applications are used in the side effects of cancer treatment (for example massage, acupuncture, music therapy, aromatherapy, etc.). It has been concluded that these techniques increase the quality of life of individuals with gynecologic cancers and reduce the side effects of gynecologic cancer treatment.

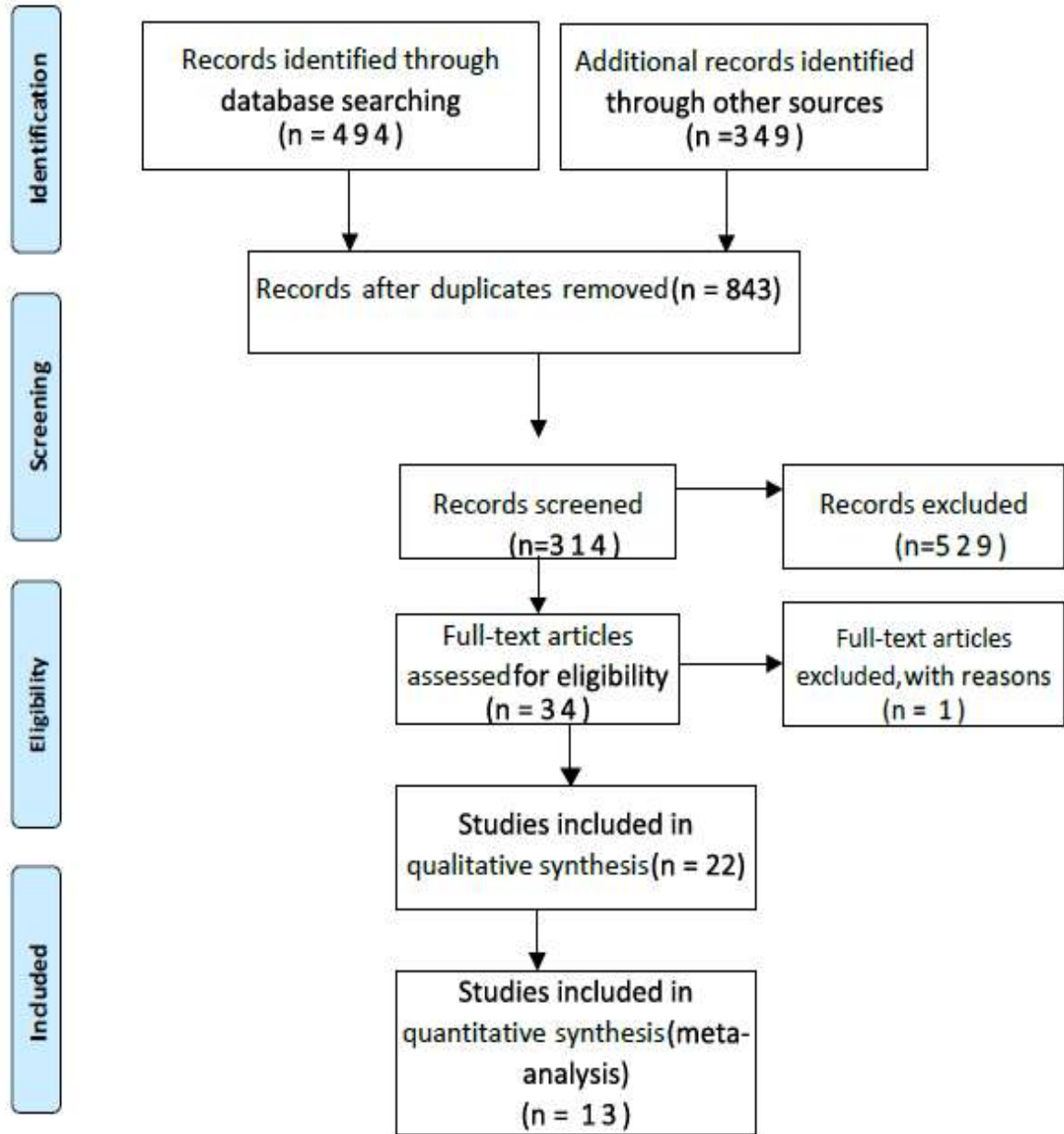
5	The place of music therapy in gynecological oncology [10]	Meriç, E. N., & Kaya, Y. (2017). Turkey	Review	Osmangazi Tıp Dergisi	This review aims to determine the importance of music therapy in gynecological oncology.			Music therapy is considered an effective method in the treatment of pain, reducing the use of analgesics, and reducing the level of stress, anxiety level, and depression symptoms. There is limited research on the effect of music in gynecological oncology literature. Imagination with music therapy helped relaxation of the back and facial muscles in the patient with ovarian cancer following chemotherapy and better/relaxed breathing pattern. Breast gynecological cancer patients experienced minimal depressive symptoms after music therapy.
6	Breast cancer, sleep, and music therapy [4]	Lafci, D. (2018). Turkey	Review	Uludağ Üniversitesi Tıp Fakültesi Dergisi	This review aims to explain the effects of music therapy on sleep as a complementary and alternative treatment in breast cancer patients.			Many studies have shown that music therapy improves the quality of sleep.
7	Symptom management for nausea-vomiting in children receiving cancer treatment: evidence-based practices [11]	Gürçan, M., & Atay Turan S. (2019). Turkey	Review	Güncel Pediatri	This review aims to provide a guide for nurses with evidence-based, up-to-date, and reliable information on nausea and vomiting in children. In addition to pharmacological methods, integrative health approaches are preferred to reduce nausea and vomiting.			Integrative health approaches frequently preferred by children following cancer diagnosis and their parents to cope with nausea and vomiting; were; acupuncture/acupressure, aromatherapy, massage, hypnosis, yoga, music, and art therapy. The assessment tools and standard treatment methods applied in the management of nausea and vomiting were insufficient. More research is needed to conduct more studies on both pharmacological and integrative methods for effective management of nausea and vomiting.
8	Effect of music therapy on anxiety and sleep quality of elderly cancer patients [17]	Gökalp, K., & Ekinci, M. (2020). Turkey	Pre-test/post-test controlled semi-experimental		This research aims to determine the effect of music therapy on anxiety and sleep quality of elderly cancer patients.	60	Information Survey, Pittsburgh Sleep Quality Index (PUKI), State-Trait Anxiety Inventory	Analyses revealed the statistically significant decrease in anxiety levels after music therapy was the state anxiety and trait anxiety mean scores of the experimental group compared to the control group. Music therapy was effective in reducing the anxiety levels of patients.
9	Effects of music therapy on depression and duration of hospital stay of breast cancer	Zhou, et al., (2011). China	Meta-analysis	Chinese Medical Journal	This meta-analysis aims to determine the effects of music therapy on depression and hospital stay in	60	General Questionnaire and Chinese version of Zung Self-rating	Music therapy has positive effects on the improvement of depression in female patients with breast cancer, and the length of hospital stay can be reduced after radical mastectomy.

	patients after radical mastectomy [16]				breast cancer patients after mastectomy.		Depression Scale (ZSDS)	
10	Chemotherapy-induced nausea-vomiting to manage the use of complementary and alternative therapy methods [6]	Özdelikara, A., & Arslan, B. (2017). Turkey	Review	Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi	This review aims to determine chemotherapy-induced nausea-vomiting CAM methods.			Progressive relaxation exercises and reflexology methods performed by experts in the field can be used safely, however, more studies with high levels of evidence are needed on hypnosis, music therapy, acupressure, and herbal methods when considering the symptoms of nausea and vomiting due to chemotherapy. Complementary and alternative medicine methods can be used for vomiting and nausea. Some of these methods in the literature are herbal methods, music therapy, massage, reflexology, relaxation exercises, acupuncture-acupressure, and hypnosis.
11	Occupations of outpatient cancer patients during chemotherapy: Results of a questionnaire-based study [3]	Çokmert, S., Yavuzşen, T., & Ünek, İ. (2011). Turkey	Cross-sectional, Descriptive	Acıbadem Üniversitesi Sağlık Bilimleri Dergisi	This research aims to determine the occupational preferences of cancer patients receiving chemotherapy that can reduce their anxiety about chemotherapy during the time they receive treatment.	100	Questionnaire	Music therapy service can be offered to patients during chemotherapy, as it is an effort that can be easily applied and reached in all conditions in chemotherapy units.
12	Complementary and alternative therapy methods used in the management of chemotherapy-induced nausea and vomiting [2]	Arslan, M., & Özdemir, L. (2015). Turkey	Review	Türk Onkoloji Dergisi	This review aims to explain the complementary and alternative treatment types used in patients who develop nausea and vomiting due to chemotherapy.			Many symptoms occur due to the side effects of chemotherapy. CAM used in this field is herbal products such as relaxation, hypnosis, acupuncture, acupressure, yoga, meditation, massage, music, reflexology, cryotherapy, and aromatherapy. They cause a decrease in the duration and amount of nausea and vomiting in the patients.
13	Reasons for the use of complementary and alternative medicine (CAM) in Cancer Patients [14]	Özçelik, H., & Fadıloğlu, Ç. (2009). Turkey	Review	Türk Onkoloji Dergisi	This review aims to provide information about the reasons for the use of CAM by cancer patients and the factors affecting it.			Reasons for CAM use: to provide treatment, to support treatment, to prevent cancer recurrence, to use instead of conventional treatments, and to use as a last choice. Among the factors affecting the reasons cancer patients use CAM; Perceptions of patients about CAM, Beliefs of patients about conventional treatments Concern and anxiety about side effects of conventional treatments

								<p>Communication/relationship between patient and health care team.</p> <p>The need for the perception of control was determined as the belief that it is effective. Music therapy is among the Body-Mind interventions in CAM and among the methods that can be used for symptom management (music therapy, spiritual healing, psychological support interview, prayer). However, it is noteworthy that studies on the effects of music therapy in coping with cancer side effects are limited in the literature.</p>
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PRISMA 2009 Flow Diagram



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

Figure 1: PRISMA 2009 Flow Diagram

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