

## Effects of dance therapy on the rehabilitation of patients with cancer: a systematic review

Efeitos da dançaterapia na reabilitação de pacientes oncológicos: uma revisão sistemática

Efectos de la danzaterapia en la rehabilitación de pacientes con cáncer: una revisión sistemática

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### Letícia Santos da Silva

ORCID: <https://orcid.org/0000-0001-9516-497X>  
Tiradentes University, Brazil  
E-mail: [leticia.fisiolet@gmail.com](mailto:leticia.fisiolet@gmail.com)

### Gleissy Mary Souza Santos Lima

ORCID: <https://orcid.org/0000-0002-0149-6322>  
Tiradentes University, Brazil  
E-mail: [gleissy.mary19@gmail.com](mailto:gleissy.mary19@gmail.com)

### Emilly Santana Santos

ORCID: <https://orcid.org/0000-0002-8311-3179>  
Tiradentes University, Brazil  
E-mail: [emilly.santossantana16@gmail.com](mailto:emilly.santossantana16@gmail.com)

### Catarina Andrade Garcez Cajueiro

ORCID: <https://orcid.org/0000-0002-5192-9288>  
Tiradentes University, Brazil  
E-mail: [andradecata@hotmail.com](mailto:andradecata@hotmail.com)

### Aida Carla Santana de Melo Costa

ORCID: <https://orcid.org/0000-0002-4192-7887>  
Tiradentes University, Brazil  
E-mail: [aida-fisio@hotmail.com](mailto:aida-fisio@hotmail.com)

### Lícia Santos Santana

ORCID: <https://orcid.org/0000-0002-4720-8293>  
Tiradentes University, Brazil  
E-mail: [licia2s@hotmail.com](mailto:licia2s@hotmail.com)

### Maria Jane das Virgens Aquino

ORCID: <https://orcid.org/0000-0001-9692-0271>  
Tiradentes University, Brazil  
E-mail: [mjvafisio@gmail.com](mailto:mjvafisio@gmail.com)

### Davi Santana Sousa

ORCID: <https://orcid.org/0000-0001-7103-4441>  
Tiradentes University, Brazil  
E-mail: [davi.santana.sousa@hotmail.com](mailto:davi.santana.sousa@hotmail.com)

### Abstract

**Introduction:** The diagnosis of cancer causes several changes in the lives of human beings, generating impacts on the emotional, physical and psychological state. Fear, stress and sadness usually interfere in quality of life, so dance therapy is a therapeutic method that will serve as an instrument for health rehabilitation, using dance as a means to achieve functional balance and self-esteem of people diagnosed with cancer. **Objective:** To describe the effectiveness and benefits of dance therapy, in order to emphasize complementary therapies that are important methods during treatment. **Material and Methods:** Systematic review, in which articles were selected between 2018 and 2021. Published in both Portuguese and English languages in the electronic database as Latin American Caribbean Literature in Sciences of Health (Lilacs), Pubmed, *Scientific Electronic Library Online* (Scielo) and *Physiotherapy Evidence Database* (PEDro). **Results:** The search for data was summarized in a flowchart, in which 546 articles were found based on the combination of descriptors in health science, but after reading, 8 scientific articles were selected divided into three categorical themes; psychological and social. **Conclusion:** Dance therapy provides physical, psychosocial benefits directly in functional capacity and quality of life during choreography and musical rhythms, influencing functional capacity, self-image, acceptance and especially quality of life.

**Keywords:** Cancer; Rehabilitation; Therapy through dance; Complementary activities.

### Resumo

**Introdução:** O diagnóstico do câncer causa diversas alterações na vida dos seres humanos, gerando impactos no estado emocional, físico e psicológico. O medo, estresse e tristeza costumam interferir na qualidade de vida, então a dançaterapia é um método terapêutico que irá servir como instrumento para reabilitação em saúde, utilizando a dança

como meio para alcançar o equilíbrio funcional e autoestima das pessoas diagnosticadas com câncer. **Objetivo:** Descrever a efetividade e os benefícios da dançaterapia, a fim de enfatizar terapias complementares que são métodos importantes durante o tratamento. **Material e métodos:** Revisão sistemática, onde foram selecionados artigos entre os anos de 2018 e 2021. Publicados na língua portuguesa e inglesa na base de dados eletrônicos como Literatura Latino-Americana de Caribe em Ciências da Saúde (Lilacs), Pubmed, Scientific Eletronic Library Online (Scielo) e Physiotherapy Evidence Database (PEDro). **Resultados:** A busca de dados foi resumidas em um fluxograma, onde foram encontrados 546 artigos baseados na combinação dos descritores em ciência da saúde, porém após a leitura foram selecionados 9 artigos científicos divididas em três temáticas categóricas; físico, psicológica e social. **Conclusão:** A dançaterapia proporciona benefícios físicos, psicossociais diretamente na capacidade funcional e qualidade de vida durante a realização das coreografias e ritmos musicais, influenciando na capacidade funcional, autoimagem, aceitação e principalmente na qualidade de vida.

**Palavras-chave:** Câncer; Reabilitação; Terapia através da dança; Terapias complementares.

### Resumen

**Introducción:** El diagnóstico de cáncer provoca varias alteraciones en la vida de los seres humanos, generando impactos en el estado emocional, físico y psicológico. El miedo, el estrés y la tristeza suelen interferir en la calidad de vida, por lo que la danzaterapia es un método terapéutico que servirá como instrumento para la rehabilitación de la salud, utilizando la danza como medio para lograr el equilibrio funcional y la autoestima de las personas diagnosticadas con cáncer. **Objetivo:** Describir la efectividad y los beneficios de la danzaterapia, con el fin de enfatizar las terapias complementarias que son métodos importantes durante el tratamiento. **Material y Métodos:** Revisión sistemática, donde los artículos fueron seleccionados entre los años 2018 y 2021. Publicado en portugués e inglés en la base de datos electrónica Latin American Caribbean Literature in Health Sciences (Lilacs), Pubmed, Scientific Electronic Library Online (Scielo) y Physiotherapy Base de Datos de Evidencia (PEDro). **Resultados:** La búsqueda de datos fue resumido en un diagrama de flujo, donde se encontraron 546 artículos basados en la combinación de descriptores de ciencias de la salud, pero después de la lectura de 8 artículos científicos divididos en tres temas categóricos; físicos, psicológicos y sociales. **Conclusión:** La danzaterapia proporciona beneficios físicos y psicossociales directamente sobre la capacidad funcional y calidad de vida durante la realización de coreografias y ritmos musicales, influyendo en la capacidad funcional, la imagen, la aceptación y principalmente en la calidad de vida.

**Palabras clave:** Cáncer; Rehabilitación; Terapia a través de la danza; Terapias complementarias.

## 1. Introduction

The term cancer is used to refer to a hundred diseases by the disordered growth of cells in the human body through successional mutations that cause numerous biopsychosocial impacts on the individual and his family. Cellular alterations can be manifested through intrinsic factors, such as genetic inheritance or even extrinsic factors, such as life habits and certain work activities exposed (Paula et al, 2019).

The constant growth of this pathology in the world population has affected lots of families, which is justified by the rapid aggressiveness of the progression of the disease that affects only a specific organ or the whole organism through the spread of metathesis due to the affinity and interaction of certain tissues. The pathology affects individuals of various groups of age gender and women. However, in recent years sociodemographic censuses have shown high rates of cancer and mortality in males living in rural areas. This is explained by the great taboo imposed by society on men, and it is emphasized that individuals of this gender who seek medical treatment have a sign of fragility (Lee et al, 2021).

The diagnosis of cancer impacts on the quality of life of a person. Numerous aspects are compromised in the body's systems, which trigger a series of symptoms resulting from the disease itself or secondary to treatment, for example, intense lung in the body, reduction of range of motion, muscle weakness that in the vast majority of cases is accompanied by fatigue, nausea, fevers, dyspnea, vomiting, sleep disorders, reduced cognitive, sexual and other functionality that may occur during the evolution of disease or its treatment histher. Emotional aspects also influence the quality of life of the affected person and family, mainly due to the great uncertainty of survival during and after treatment, causing an increase in the levels of cortisol, depression and anxiety, wich might impair the entire healing process to keep the patient alive (Lee et al, 2021).

Due to the various alterations mentioned above in various systems of the human body caused by cancer, the treatment is aggressive and harmful to the functionality of the individual, mainly because the most common methods of treatment of this

pathology are hormone therapy, surgical procedures, chemotherapy, radiotherapy or combination of more than one of these methods. Therefore, there is a need to insert complementary therapies during the rehabilitation of cancer patients, in order to seek to minimize the deleterious effects of treatment and bring to the patient's routine the maximum of functionality and life (Carmo, 2013; Bujan, 2017).

Complementary therapies include several methods, such as dance therapy that emerges as an efficient therapy capable of reducing the symptomatology of individuals affected by cancer. Dance is part of Brazilian culture and is presented in the daily lives of all people. With different rhythms, it allows us to freely express our own emotions. Through its practice it is possible to connect the mind and body following steps and synchronous choreographies and, through dance therapy it becomes possible to release which helps to hormones that cause numerous benefits such as feeling of well-being and pleasure, reducing which help to the depressive clinical picture and anxiety of these individuals, giving them a greater social interaction and quality of life (Mörttinen-Vallius, 2021; Simão et al., 2017).

The movements generated in dance through choreographies that the person can determine provide the development of a new personal construction of learning. It is through the mind-body connection developed during the performance of movements that the individual acquires physical and emotional, changes being able to improve cardiopulmonary conditioning, in the perception of space-time, and stimulate balance and motor coordination. Thus, it is possible to reduce the risks of fall, obtain gains in range of motion due to the various choreographed steps that require displacement of members to diverse directions, in addition to stimulating social interaction when dance is developed in groups or communities, enabling an exchange of experiences, information and emotional support between the people involved and their families (Seekcio et al., 2018; Garção, 2011).

The various possibilities of movement through dance associated with exercises during physical therapy rehabilitation allow the treatment to be efficient and relaxed, ensuring greater adherence on the part of patients and favoring the resignification of their identity throughout the whole process. Therefore, dance therapy is able to directly influence the rehabilitation of cancer patients and allows possible beneficial prognoses, reducing the attenuation of the symptomatological picture, generating impacts on physical, emotional and social aspects of the individual favouring functionality and quality of life during the process of rehabilitation (Ramos & Medeiros, 2018; Garção, 2011; Marques, 2012).

Therefore, the present study aims to systematically review the literature in order to describe the effectiveness and benefits of dance therapy in the physical, emotional and social aspects in the rehabilitation of cancer patients in order to emphasize that complementary therapies are important methods during treatment.

## **2. Methodology**

### **2.1 Procedures**

The research is characterized as a systematic review of studies and includes the methodological procedures detailed in the items below.

### **2.2 Eligibility criteria**

Scientific articles focused on the health sciences area that included interventions through dance therapy in patients with cancer from all groups of age and genders were selected for the preparation of this paper. In order to prioritize the most current studies on the theme in question, articles published between 2018 and 2021 were selected, and papers published in English and Portuguese were inserted, considering their availability in electronic databases.

### 2.3 Exclusion criteria

We excluded papers that did not fit the proposed inclusion criteria, such as articles that emphasized other techniques with absence of dance intervention and that highlighted dance as palliative care, in addition to studies who did not present at public disposal summaries, reports, systematic reviews and studies addressing dance in the rehabilitation of individuals who no longer had the diagnosis of cancer for more than 10 years.

### 2.4 Search strategy

A bibliographic search was conducted during November 2021 for scientific articles in electronic databases such as Latin American and Caribbean Literature on Health Sciences (Lilacs), Pubmed, *Scientific Electronic Library Online* (SciELO) and *Physiotherapy Evidence Database* (PEDro) of studies that emphasized dance rehabilitative method in the treatment of individuals with cancer.

From this, the search strategies proposed to address the specific subject were the Descriptors in Health Sciences (DeCs), "cancer", "cancer", "dance", "*dance*" and "rehabilitation", "*rehabilitation*", and the Boolean operator "AND" was also used and the application of the filters from the years "2018 to 2021" were used to optimize the results by combining the descriptors.

### 2.5 Selection of studies

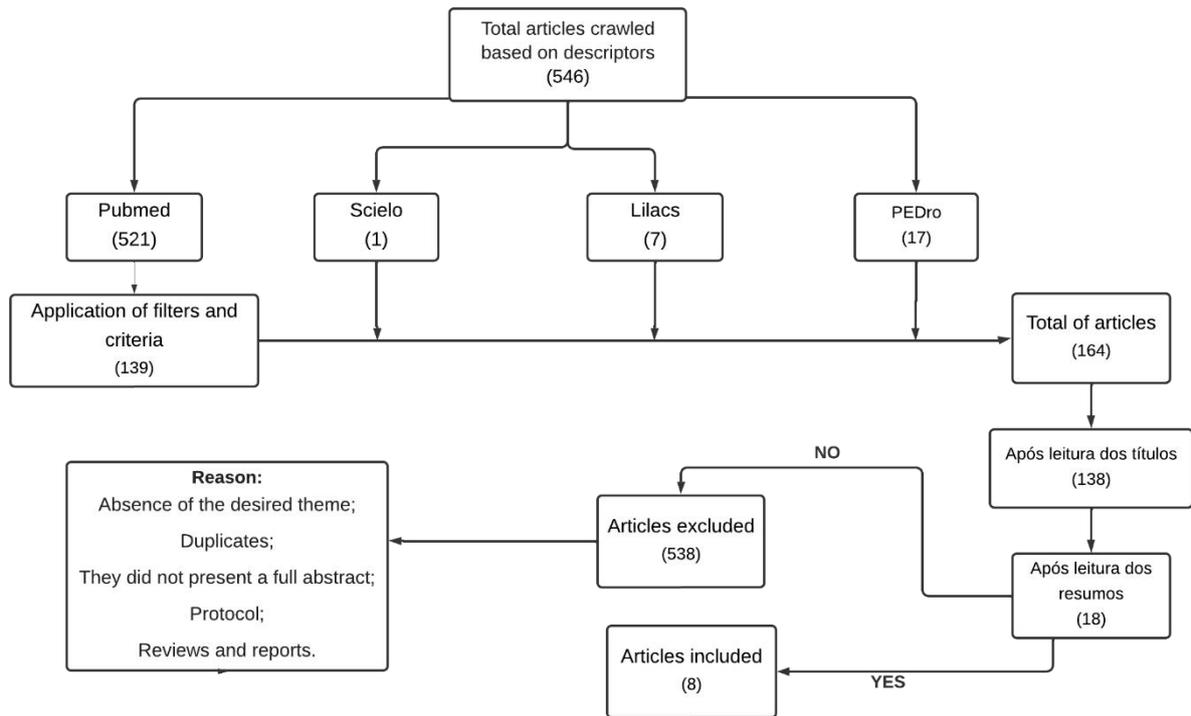
Subsequently, we searched articles based on the above-mentioned descriptors which guided us to exclude, repeated articles considering their titles. Furthermore, the abstracts found based on the descriptors were previously read and the papers that did not address the proposed theme were discarded. Finally, after reading the titles and abstracts of the papers, scientific studies that did not fit the proposed criteria excluded.

## 3. Results

The search results in the databases are presented and summarized in the flowchart below in Figure 1. A total of 546 articles were found based on the combination of descriptors in health sciences in electronic databases, in order to optimize the research, the filter "2018 to 2021" and "abstract" in the Pubmed database were applied, justifying the data with a greater number of papers.

After reading the titles and applying the inclusion and exclusion criteria, only 8 studies were selected for this systematic review.

**Figure 1** - Flowchart with synthesis of the articles.



Source: Elaborated by the authors.

Next, Table 1 summarizes in a simple way the information of the selected articles, highlighting the year of publication, title of the study, journal and/or journal of publication and what aspect the study emphasized through dance.

**Table 1** – Summary of the articles included in this systematic review.

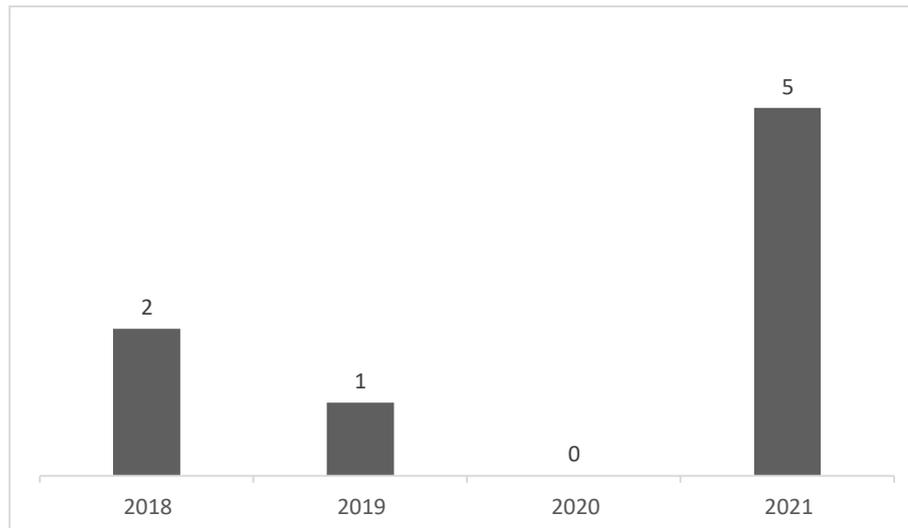
Year	Title	Periodic	Aspect
2018	Benefits of belly dancing in quality of life, fatigue and depressive symptoms in women with breast cancer – A pilot study of a non-clinical trial Randomized	Journal of Bodywork and Movement Therapies	Physical and psychological aspect
2018	Perceived stress moderates the effects of a randomized study of dance motion therapy on daytime cortisol inclinations in patients with breast cancer	Psychoneuroendocrinology	Psychological aspect
2019	Effects of belly dancing on body image and self-esteem in women with breast cancer – pilot study	Brazilian Journal Sports Medicine	Physical and psychological aspect
2021	Belly dancing and Mat Pilates may be effective for range of motion, self-esteem and depressive symptoms of women with breast cancer?	Complementary Therapies in Clinical Practice	Physical and psychological aspect
2021	The influence of 12-week dance intervention on sleep quality and pain in women with breast cancer – a pilot study of a non-clinical trial Randomized	Journal of Bodywork and Movement Therapies	Physical aspect
2021	Dancing health: quality of life and physical improvements of an EU collaborative dance programme with women after breast cancer treatment	Frontiers in Psychology	Physical, psychological and social aspect
2021	Influence of ballroom dancing on fatigue, body image, self-efficacy and endurance cancer patients and their partners	Medical Oncology	Physical, psychological and social
2021	Perceptions of Women in Breast Cancer Treatment about the Impact of Belly Dance on Optimism and Self-esteem: MoveMama Study	Rev. bras. cancerol	Psychological and social aspect

Source: Elaborated by the authors.

### 3.1 Quantitative analysis

Figure 2 shows the number of published articles that were inserted in this review according to each year. Notably, it is possible to identify that in 2021 we have the largest number of publications. However, although there were less articles published on the same topic in previous years, it is important to highlight that dance was already thought of as complementary therapy in the rehabilitation of patients with cancer and that the vast majority of these publications emphasized dance as rehabilitative method in individuals with breast cancer.

**Figure 2** – Publication of articles in the last 4 years.

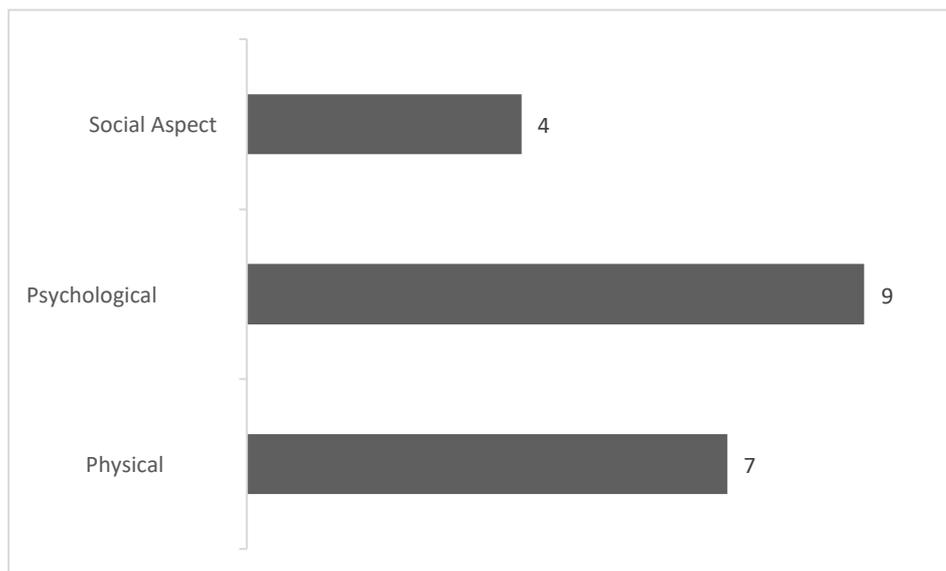


Source: Elaborated by the authors.

### 3.2 Qualitative analysis

The 8 scientific articles included in this systematic review were divided into categories: **physical** – studies that analyzed physical-motor issues (e.g., coordination, body awareness and range of motion), **psychological** – articles that sought to better understand emotional aspects of individuals with cancer and improve their quality of life (e.g., anxiety, depression and self-esteem), but some studies have addressed **the social** aspect – works that addressed the social environment and interaction with other people diagnosed with cancer or not (e.g., inclusion in community groups and social participation). However, some studies were classified into up to 3 categories, due to the methodology and results addressing one or even three categorical themes.

**Figure 3** – Number of articles related to the categories explored.



Source: Elaborated by the authors.

In Table 2, there is information related to the studies that were selected and included in this review, emphasizing in an organized and summarized way the authors of the studies and the objectives of the studies, as well as the methods and results. The purpose of the preparation of the tables was to clearly and objectively organize the selected articles, and it was possible to later perform analyses and comparisons between the studies in an agile and simple manner.

**Table 2** – Summary of the description of the contents found in the articles included in this systematic review.

AUTHORS	STUDY OBJECTIVE	METHODS	FINDINGS
BOING et al., 2018	Analyze the influence of belly dancing on quality of life, fatigue and depressive symptoms in women with breast cancer.	Pilot study of a non-randomized clinical trial; Criteria: 40 to 80 years, in clinical treatment or after, know how to read, write and not be in stage IV of breast cancer; The sample consisted of 19 women (EG= 8 and CG= 11); EG submitted to 12 weeks of belly dance, twice a week with 60 minutes of class) and may be individual or group; Questionnaires related to quality of life, depressive symptoms, fatigue, physical activity, personal and clinical aspects before and after the intervention and application of a questionnaire to change after intervention.	Personal, clinical information, fatigue and depressive symptoms had no difference in CG. The EG showed improvements in body and image perception, sexuality, clinical, depressive symptoms and fatigue. The self-perception and quality of these women improved. The practice of physical activity showed no significant difference between EG and CG; There was an increase in the social environment of the women of the EG.
HO, FONG; YIP, 2018	To analyze the effects of dance movement therapy (TDD) on the daytime cortisol rhythms of breast cancer patients undergoing radiotherapy and the role of perceived stress in the production of these effects.	Randomized controlled clinical trial; The sample consisted of 121 women (GI= 63 and CG= 58); Criteria: women with 18+ Chinese women with primary breast cancer between stages 0 to III, with absence of recurrent disease or other types of cancer, psychiatric pathologies and pathologies and physical disabilities that prevented the performance of the dance; Five salivary cortisol samples were collected before and after intervention frequently 5 times a day at the residence of the totaling 605 samples, then analyzed; Application of questionnaires that evaluated stress, sleep disorders, fatigue and pain. The dance intervention consisted of 3 weeks, 6	Dance and movement therapy showed a decline in daytime cortisol in the participants, favoring positive effects on the neuroendocrine system, being beneficial for reducing high levels of stress and pain, assisting in the patient's quality of life and treatment optimization.

		<p>sessions lasting 1h and 30min for 2 times a week with stretching steps, relaxation exercises, rhythmic movements and improvised dance. The control group received nursing care and radiotherapy after data collection participated in the intervention.</p>	
CARMINATI et al., 2019	Analyze the influence of belly dancing on body image and self-esteem of women during and after breast cancer treatment	<p>A pilot study of a non-randomized clinical trial conducted at the Center for Oncology Research in Santa Catarina; Criteria: 40 to 80 years, in clinical treatment or after, know how to read, write and not be in stage IV of breast cancer;</p> <p>The sample n of 19 women (EG= 11 and CG= 8) applied questionnaires and scales related to general aspects, body image, self-esteem and interview; Intervention with belly dance in gym and lasting 12 weeks, divided into regular classes of 60 minutes and often 2 times a week and for the CG, participants were asked to maintain their activity habitual physical activity.</p>	<p>There was an improvement in body image in the intervention group in the pre- and post-intervention periods, however, there was no significant change in self-esteem in the EG and CG, but the EG still obtained the best result compared to the CG.</p>
LEITE et al., 2021	To analyze the effect of an intervention with belly dance or pilates in the range of movement, self-esteem and depressive symptoms in women with breast cancer who received hormone therapy.	<p>Simple blind randomized clinical trial; Criteria: age 18+, diagnosis of breast cancer between stages 0 to III performing adjuvant hormone treatment, have authorization, without orthopedic and neurological diseases. Sample of 52 women divided into 3 groups (A= 18, B= 18 and C= 16), where they answered questionnaires with personal and clinical characteristics, self-esteem scales and depressive symptoms, participated in a physical examination and pre- and post-intervention interviews;</p> <p>The intervention was performed during 16 weeks, totaling 48 sessions divided into 3 times a week lasting 60 minutes. Group A and B sessions were divided into 3 moments (warm-up, main part and relaxation) and group C received 3 educational sessions. At the end all groups received guidance and booklet.</p>	<p>The findings suggest that belly dance, solo pilates and patient education have benefits in upper limb ROM for women with breast cancer, but the pilates method showed more improvements significant. In the aspect of self-esteem and depressive symptoms, the results did not show great improvements in the groups, however, the intervention groups would show the best results.</p>
HIANSDT et al., 2021	Analyze the effects of a 12-week dance intervention on sleep quality and pain level among women with breast cancer.	<p>Pilot study of a non-randomized clinical trial, divided into 2 groups (GI= 11 and CG= 10); Criteria: women aged 40+ with stage of cancer between I and III, adjuvant or finaltreatment, who did not have neurological pathologies or physical limitations; A sample of 21 women who were submitted to questionnaires that evaluated biopsychosocial aspects, such as pain and sleep quality and pre - and post-intervention.</p> <p>The intervention occurred in the gym, with a total of 12 weeks, totaling 24 sessions divided into 2 times a week lasting 60 minutes. The sessions were organized in phases, being warm and stretching, main part and relaxation, the CG was asked to maintain its normal routine.</p>	<p>The benefits were not significant in sleep quality or pain, but there was a small improvement in sleep quality in both groups and in the CG a small decrease in pain. However, based on the reports of the participants it was observed that the intervention provided well-being and greater social support among the participants.</p>
KARKOU et al., 2021	Evaluate a dance program for women in recovery breast cancer in five European countries	<p>Pilot study of a dance program in 5 countries; Criteria: breast cancer diagnosis less than 3 years ago, completed chemotherapy, capacity and willingness to moderate physical activity, absence of metastasis or surgery chemotherapy and radiotherapy during the</p>	<p>There were significant differences in the anthropometric and the aspects of physical and cardiopulmonary conditioning, symptomatic psychosocial and quality of life the benefits were greater</p>

		<p>intervention;</p> <p>Sample of 54 women who underwent quality of life questionnaires, scales, measurement anthropometric and muscle strength, balance, mobility, flexibility and pre and post strength, balance, intervention walking;</p> <p>The intervention consisted of the application of dance with several styles with separate exercise components in 5 stages;</p> <p>Protocol performed for 4 months, divided 2 hours lasting 60 minutes each session and divided into warming learning and performing the dance relaxation.</p>	
THIESER et al., 2021	Assess the influence of dance of salon about fatigue, picture body, self-efficacy and exercise capacity	<p>Study of a dance training where they were recruited participants of a dance training;</p> <p>Criteria: all ages, both genders, different types of cancer and with ongoing or finalised treatment;</p> <p>Sample composed of 66 participants, submitted to questionnaire that included body image, scales, fatigue and general beliefs of self-efficacy, walking test and training;</p> <p>The training was carried out for 22 weeks, once in the week lasting 90 minutes with various types of dances. The members were divided into GI, GB and GA.</p>	Training did not influence significantly in fatigue and body image of the participants, however, obtained results significant impacts on functional capacity, as well as social life and quality of life the individuals who participated in the interventions in the 3 groups.
SILVA et al., 2021	Investigate the perceptions of optimism and self-esteem of women undergoing complementary treatment of breast cancer hormone therapy after belly dance interventions.	<p>Randomized clinical trial with quantitative, descriptive and exploratory approach conducted in Santa Catarina;</p> <p>Criteria: 18+, stage I to III of cancer, not presenting orthopedic and neurological restrictions, being in treatment and with release of oncologist and physiotherapist for the practice of physical activity;</p> <p>The sample consisted of 14 women, after unforeseen events only 5 participated in the interview;</p> <p>Individual interview, application of questionnaires related to socioeconomic variables, optimism and self-esteem before and after the intervention, observation of the participant and application of the field diary during the intervention;</p> <p>The intervention had 48 belly dance sessions performed 3 times a week and lasting 60 minutes and the patient's lifestyle education was performed at the end intervention.</p>	<p>Significant increase in self-esteem and optimism among 14 women;</p> <p>However, the 5 women who finished the intervention with belly dancing there were no significant differences in optimism and self-esteem, but there were improvements in pain, emotional benefits, feeling of well-being, among other.</p>

Legend for reading the results table:

ADM: range of motion; GA: group of advanced knowledge; GB: basic knowledge group; GI: beginner knowledge group (THIESER et al., 2021); GI: intervention group; CG: control group; EG: experimental group.

Source: Authors.

#### 4. Discussion

The term cancer is used to perform the description of a set of numerous diseases that are completely distinct from each other. Given all the differentiation, there is an important feature that resembles in all types of cancers, which is precisely the abnormal growth of cells in some organ or tissue of the human body, according to the National Cancer Institute (INCA, 2020).

Karkou et al., (2021) conducted a study with varieties of Latin American dances, presented within a structure of sports and exercises with influences of dance movement therapy. The research showed that, given the data that were collected from

anthropometric measurements and fitness from the quality of life of women with breast cancer, they found statistically significant changes in all cases and the direction of change was positive both in the physical measure and in quality of life. In addition, changes in anthropometric measurements, physical conditioning and quality of life showed that the intervention was valuable among women recovering from breast cancer.

In contrast, Xiaole et al., (2020), explored a dance protocol that showed to be efficient to relieve fatigue, sleep disorders and improve quality of life among women diagnosed with breast cancer during adjuvant chemotherapy. In this study, a randomized randomized design was used and combined with an interview composed of twenty women who were randomly assigned to a dance group or attention control group, after initial evaluation, before chemotherapy. The women for whom they participated in the study were diagnosed with stage I-II of breast cancer. The study questionnaires were understandable and completed for approximately 30 to 40 minutes. The basal characteristics were comparable between the groups, indicating the success of randomization, showing that the dance protocol was feasible for breast cancer patients in hospital and home environments, on the effects of management in promoting quality of life.

In the protocol of BOING et al., (2020), the authors evaluated solo pilates classes and belly dance, two types of activities involving mental and physical concentration, music, upper and lower limbs movements and involvement. The study was conducted with women diagnosed with breast cancer on the primary outcome of quality of life and secondary physical aspects, where they were asked for solo pilates classes or belly dance, three times a week, for 16 weeks or in another group classified as control. A booklet with physical activity was distributed for the participants with the objective of stimulating new lifestyle habits such as the practice of exercises and daily routine maintenance.

The results of the solo pilates and belly dance intervention protocol showed that the two physical activities are important for this population, and that they help minimize the collateral effects of the disease and its treatment, assisting in recovery, improving quality of life, in addition to mitigating the psychological and physical outcomes of women after breast cancer diagnosis. Leite et al., (2021) also evaluated the effects of pilates dance, the interventions showed positive effects on the range of motion of women with breast cancer submitted to hormonal therapy, highlighting the pilates method, which stood out in the improvement of these participants.

Ho e Fong et al., (2018), stated that women with breast cancer are at risk of psychosocial distress and may present changes in daytime cortisol. The study was conducted with 121 Chinese patients with breast cancer divided into a movement therapy group with dance and control group, the intervention consisted of six 1.5-hour sessions performed twice a week. Perceived stress was assessed by the Chinese version of the Perceived Stress Scale (PSS) and it was observed that despite the absence of significant effect of dance movement therapy (TDD) on low-level cortisol, patients with high stress at the beginning of therapy tend to benefit modulation of neuroendocrine responses.

Thieser et al., (2021), observed that ballroom dancing can improve the ability to perform functionality during exercise, associated with self-efficacy and active lifestyle, effectively helping cancer patients during and after treatment. The study showed that the intervention has the potential to support cancer survivors at various levels, in addition to improving the performance of activities and well-being, providing functional capacity. The study used three questionnaires. Body Image Scale, Brief German Version Fatigue Inventory, designed to assess the level of fatigue and severity in cancer patients, and the Short Scale to measure general beliefs of self-efficacy (ASKU).

Hiansdt et al., (2021), studied the influence of dance; related to sleep quality and pain in women with stage I-II-III breast cancer submitted to any adjuvant clinical treatment, with the objective of analyzing the effects of a dance intervention, where it was performed through the application of *Pittsburgh Quality Index* (PSQI) questionnaires to verify the quality and sleep patterns and Visual Analog Scale (VAS) used to assess pain intensity. The study showed that there were no significant improvements, however, there were small positive effects on the sleep aspect in both groups, and the control group was

highlighted in pain reduction, in addition to these aspects mentioned above, there were positive feedbacks on pleasure of acceptance of dance.

Carminatti et al., (2019), evaluated the effects of belly dancing on body image in 19 women diagnosed with breast cancer, where they were divided into a control and experimental group, classes of belly dance were held twice a week, a stigma scale questionnaire was also applied. The transparency and Rosenberg Self-Esteem Scale. This study showed that the benefits of this activity were evidenced by spontaneous reports during classes, where it improved femininity and confidence.

Another study with women related to body health was conducted by Silva et al., 2021 The authors investigated the perceptions of optimism and self-esteem in 14 women undergoing adjuvant treatment of breast cancer hormone therapy, through belly dance interventions, using a questionnaire applied in the form of an individual interview, divided in parts as socioeconomic variables, optimism and self-esteem, using the Rosenberg Self-Esteem Scale (RAS) and with regard to optimism, a Life Orientation Test (ToV-R) instrument was also used. Therefore, the study showed that the small number of participants was a limiting factor, evidencing the need for future research to be conducted with a larger sample.

Therefore, it is possible to observe through this systematic review that cancer influences the biopsychosocial aspect of affected individuals and their families, triggering a cascade of emotions, uncertainties and symptoms. However, with the advances of science it is possible to find multidisciplinary treatments to act in the rehabilitation of these individuals. Complementary therapy associated with the dance therapy method emerges as another way to benefit the patient in the course of its recovery. The quantitative and qualitative analyses presented in the current study prove that dance therapy has positive effects in the physical, psychological and social states and that the number of publications and evidence regarding benefits has grown. Although the largest number of studies was published in 2021, in previous years dance was already seen as a complementary method of therapy capable of providing several advantages for patients with cancer, influencing cardiorespiratory conditioning, muscle strength, balance and coordination.

Finally, given the findings of the present study, it is important to highlight that each patient has his/her individuality and that it costs nothing to offer and implement new treatment methods, in order to humanize the cancer rehabilitation process, leaving the stages of the process lighter and more oriented, thus generating new habits for high-level quality of life.

## 5. Conclusion

This systematic review concludes that dance is an efficient complementary method to be performed during the rehabilitation of patients diagnosed with cancer, being able to provide benefits in the physical and psychosocial states, influencing and directly in functional capacity, self-image, acceptance and quality of life through the mind-body connection acquired during the realization of choreographies and musical rhythms. However, it is suggested that more studies be need to conduct in order to detect new benefits and expand the literature, mainly through new dance protocols that broadly cover all types of cancers, groups of age and genders, thus enriching the techniques developed by health teams and allowing the humanization and optimization of treatment.

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