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Review Article

The Effect of Art Therapy and Music Therapy on Breast Cancer Patients: What We Know and What We Need to Find Out—A Systematic Review

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Objective. To systematically review the evidence available on the effects of art therapy and music therapy interventions in patients with breast cancer. *Design*. Systematic search was conducted in PubMed, EBSCO, and Cochrane Central databases. Articles were scanned using the following keywords: "art therapy" or "music therapy" and "breast cancer" or "breast neoplasms," "breast carcinoma," "breast tumor," and "mammary cancer." Only RCTs published in English, with a control group and experimental group, and presenting pre-/post-therapy results were included. PRISMA guidelines for this systematic review were followed. *Results*. Twenty randomized controlled trials matched the eligibility criteria. Nine studies evaluated the effect of art therapy, and eleven evaluated the effect of music therapy. Improvements were measured in stress, anxiety, depression reduction, pain, fatigue, or other cancer-related somatic symptoms' management. Overall, the results show that art therapy was oriented towards the effects on quality of life and emotional symptoms while music therapy is the most often applied for anxiety reduction purposes during or before surgeries or chemotherapy sessions. *Conclusion*. Art and music therapies show effective opportunities for breast cancer patients to reduce negative emotional state and improve the quality of life and seem to be promising nonmedicated treatment options in breast oncology. However, more detailed and highly descriptive single therapy and primary mental health outcome measuring RCTs are necessary to draw an evidence-based advise for the use of art and music therapies.

1. Introduction

Cancer is the second leading cause of death worldwide, globally accounting for 1 in 6 deaths in 2018 [1] and is likely to become a major obstacle to increasing life expectancy in this century [2]. Breast cancer is the second most often diagnosed cancer type overall and the first in women [3]. Although medical advances in cancer prevention, diagnosis, and treatment continually increase survival rates [4], breast cancer diagnosis is associated with long-term psychological and physical adverse conditions [5]. Cancer diagnosis and treatment procedures are stressful and traumatic experience [6–8]. Emotional responses to cancer diagnosis and ongoing treatment range in symptoms of prolonged psychological distress, depression, and anxiety [9–11]. Women with breast cancer report decreased quality of life [12], encounter cancer-related fatigue [13], and face difficulties in coping with disease and treatment [14]. Together these studies highlight the inseparable burden of cancer diagnosis on the psychological state and the necessity to address oncopatient mental condition.

Medical improvement that extended survival rates and reduced recurrence rates also resulted in the need to efficiently address persistent side effects and emotional consequences, following breast cancer treatment and after treatment period [7]. Breast cancer survivors represent a

unique group with the highest and longest survival rate [2,5]; however, they deal with various treatment-related side effects and usually die not from breast cancer, but from cancer comorbidities [15, 16]. The improvement of quality of life in cancer patients alongside the mortality reduction become the main targets [17]. Therefore, these are growing appeals for lifestyle interventions that could strengthen positive life experience after breast cancer treatment and emotional adjustment dimension is an inseparable part of it. Integrative oncology is the newly adopted term in scientific literature representing the combination of complementary medicine therapies in conjunction with conventional cancer treatments [18]. These evidence-based interventions provided in cancer treatment centres in addition to conventional treatments address the physical, psychological, and spiritual quality of life of cancer patient [19]. Cancer treatment is not only a traditional medicine issue anymore; growing scientific field shows the importance of combining complementary medicine with target to maintain and improve cancer patient psychological well-being, address emotional distress, improve survival rates [18], and decrease comorbidities that usually arise with physically and emotional unhealthy lifestyles after breast cancer treatment [15]. Literature shows that Contemporary and Alternative Medicine (CAM) is a widespread supportive treatment option in oncology settings comprised of nonmedicated therapies generally aimed at improving patients physical/psychological well-being, increasing body's ability to overcome cancer, and prolonging survival [20, 21]. CAM includes diverse treatments provided in oncology settings, such as art therapy, music therapy, meditation, hypnosis, yoga, and imagery [22], but in this systematic review we focus on two forms: art and music therapies.

Art therapy is a form of emotional support focusing on difficulties to express psychological distress and difficult feelings, thoughts related to challenging cancer diagnosis, and treatment situation [23]. Recent systematic review evaluated six RCTs and acknowledged that art therapy enhances the psychological state among breast cancer patients [24]. Heterogeneity of outcome for mental health in relatively small number of RCTs assessed in previous systematic review complicates the analysis of the effects of art therapy for breast cancer patients. Therefore, there is an undoubtable need to renew the state of knowledge in this area and analyse the results of the newest RCTs done.

Music therapy is an effective complementary health approach in integrative oncology treatment which provides support for cancer patients. Evidence-based use of music therapy is directed to accomplish physical, emotional, cognitive, and social needs of individuals [25]. Even though recent systematic review show that music therapy is the most advantageous for improving quality of life and reducing anxiety, depression, pain, and fatigue in cancer patients [26], there is no systematic review evaluating the effect of music therapy on breast cancer patient group. To the best of our knowledge, this is the first systematic review analysing the effect of music therapy in breast cancer patient group.

Therefore, in this paper, we systematically review the evidence available on the effects of art therapy and music therapy interventions in patients with breast cancer. We also aim to identify gaps in research which, if taken into account, could help to produce evidence-based solutions for art therapy and music therapy application in breast cancer treatment.

2. Methods

We conducted an electronic literature search of the PubMed, EBSCO, and Cochrane Central databases with the following keywords: "art therapy" or "music therapy" and "breast cancer" or "breast neoplasms," "breast carcinoma," "breast tumor," and "mammary cancer" and limited to full-text RCT reports in English. We searched for clinical trials from inception to March 2020. The references of the final included studies were also reviewed. The search was conducted by two investigators (J.K. and R.J.) independently. RCTs published from 2006 till 2020 were screened by titles; duplicates were excluded, and the remaining records were screened by reading abstracts. Studies included assessed complete outcomes (including pretest and posttest) of music and art therapies in breast cancer patient group. We excluded studies reporting multiple therapies and other types of interventions, designed as a study and other than an RCT (e.g., review, survey, case study, etc.) or evaluating the effect in breast cancer group with other diseases as well as other cancer types. We performed a targeted search as shown in Figure 1 using the terms "art therapy" or "music therapy" and "breast cancer." We followed the PRISMA guidelines for this systematic review.

3. Results

3.1. Art Therapy. We included nine RCT studies (Table 1) that focused on the effect of art therapy in breast cancer patient group involving 540 participants. Six identified RCTs randomized women to the art therapy group and intervention absent control group, and three RCTs used control group with another intervention (two educational support groups or one SHAM painting group). Four studies evaluated mindfulness-based art therapies (MBAT) that used some relaxation techniques together with art therapy, two enrolled individual art therapy sessions, one study modified intervention to brief art therapy sessions, and two referred to more traditional art therapy framework. The duration of interventions was between 4 and 12 weeks. Art therapy research was oriented towards effects on quality of life and emotional symptoms.

3.2. Music Therapy. We found 11 randomized controlled trials (Table 2) with 1002 participants where the effectiveness of music intervention for women with breast cancer were documented. Studies varied in methodologies: the majority of studies used standard RCT format with an experimental group and no intervention control group (seven RCTs), three studies were comprised of three comparative groups (two different music intervention groups and one control), one used active control group who listened to ambient music and intervention group, and one study compared

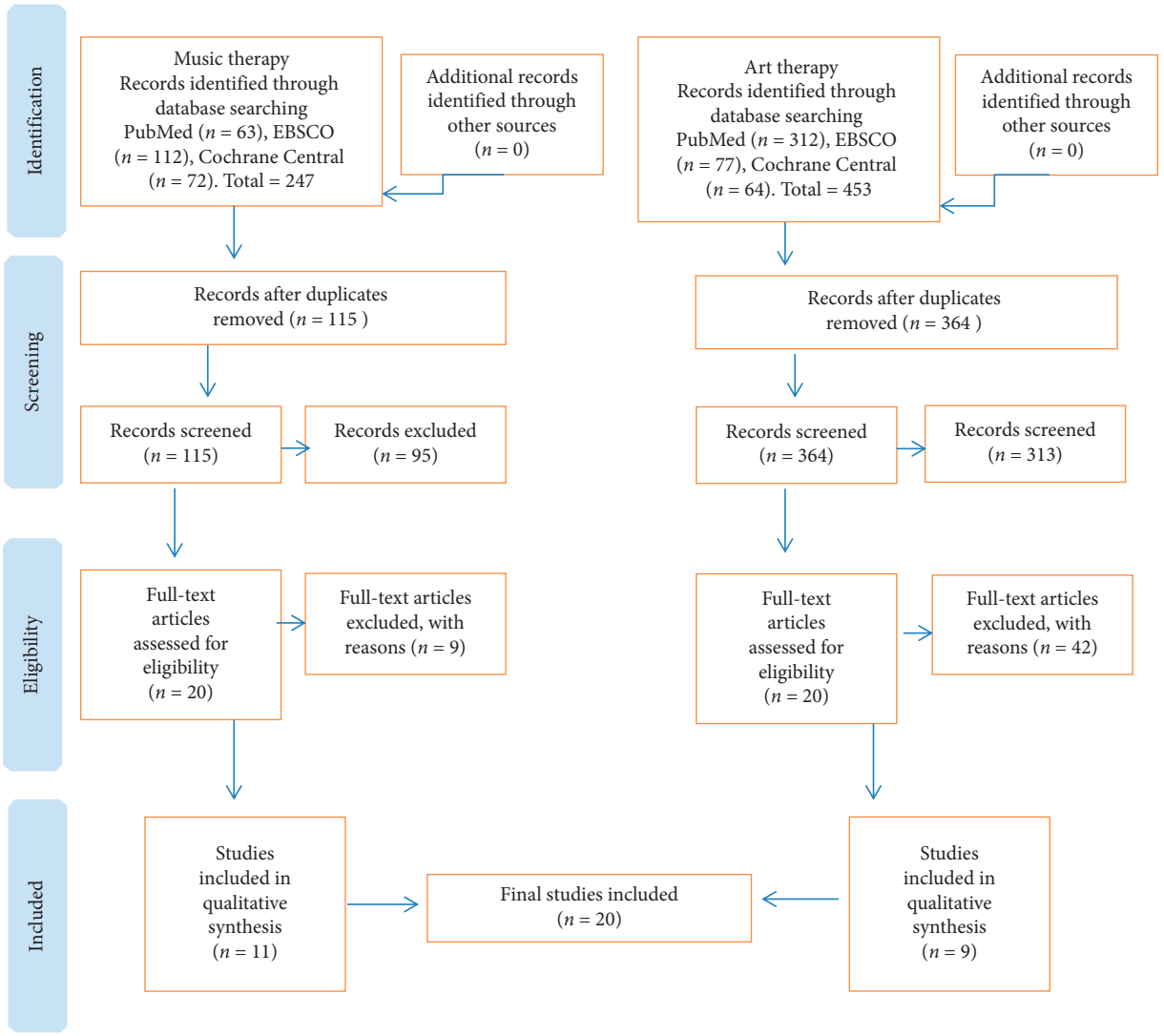

Figure 1: Flowchart of citations and articles through the phases of screening and eligibility evaluation.

intervention group with control group where patients received psychosocial conversations. Studies varied greatly on the performance (from listening to prepared music set, singing together to listening to live song performance), duration (from 5 min intervention to 2.5 h session), and frequency (from single intervention to 24-week long music therapy sessions 5 times a week). Mostly music therapy interventions were implemented in the preoperative or during chemotherapy treatment seasons with anxiety reduction aim.

4. Discussion

4.1. What Do We Know?

4.1.1. Art Therapy. Art therapy is a category of complementary interventions applied in oncological settings and intended to ease or control the physical and psychological symptoms caused by cancer and cancer treatment [46]. Art-making in a therapeutic setting alleviates emotion expression and communication, therefore providing the cancer patient with the opportunity to reduce psychological discomfort, cope with anxiety and depression, or to receive adequate social support [47]. In general, the expectation from art therapy as a complementary form of oncodisease treatment is to improve the quality of life of cancer patients. The most recent and comprehensive study analysed the effect of art therapy for emotional symptom reduction [35]. The study evaluated emotion processing in art therapy (art therapy group) vs. SHAM (mandala group) that painted prefabricated shapes without explicit focus on emotion. Between-group comparison showed the large effect of art therapy on depression reduction and increasing of emotional awareness and emotional acceptance. A small effect for specific to cancer physical symptoms was also detected. Authors report the emotion processing in art therapy group to be a potential mechanism in reduction of depression symptoms and physical symptoms in cancer patients [35]. Another study also evaluated the effect of AT for emotional symptoms expressed by breast cancer patients [33] and found significantly decreased depressive and anxiety symptoms in the intervention group. Results also indicated

Table 1: Reviewed studies in art therapy according to sample, intervention, outcomes, and main findings.

Study author, year	Sample	Intervention: *content, duration, and frequency*	Outcome indicators: *Primary* [1] *Secondary* [2]	Scale	Main findings and effect sizes (*Cohen's d if applicable*)
Öster et al., 2006 [27]	$N = 41$ (37–69 years). IntGr $n = 20$, ConGr (not described) $n = 21$	(i) Individual sessions of art therapy, phenomenological method (ii) 5 weeks (one session per week, duration not specified)	Coping resources [1]	CRI	After 2-month postintervention (CRI mean score) art therapy was associated with improvement in (i) Coping resources in the social domain: IntGr 53.3 (±9.0); ConGr 45.0 (±12.3); $p < 0.05$ (Cohen's d: 0.77). (ii) Total scores: IntGr 257.2 (±28.7); ConGr 233.6 (±44.1); $p < 0.05$ (Cohen's d: 0.63). After 6-month postintervention (CRI mean score) improvement remained in the social domain: IntGr 53.6 (±7.2); ConGr 47.4 (±10.0); $p < 0.05$ (Cohen's d: 0.71).
Puig et al., 2006 [28]	$N = 39$ (aged >18). IntGr $n = 20$, ConGr (waitlisted) $n = 19$	(i) Individual counseling session that involved semistructured creative art therapy experience and guided meditation to help exploration of spiritual themes (ii) 4 weeks (one session for 1 h/week)	Emotional [1] expression Spirituality [1] Psychological well-being [1]	EACS ESI-R POMS	Immediate postintervention art therapy (POMS mean score) was associated with better psychological well-being: (i) Tension-anxiety subscale: IntGr 17.31 (±5.01); ConGr 20.32 (±6.78); $p < 0.05$ (Cohen's d: 0.50). (ii) Depression-dejection subscale: IntGr 20.66 (±4.74); ConGr 26.34 (±8.48); $p < 0.05$ (Cohen's d: 0.83). (iii) Anger-hostility subscale: IntGr 15.79 (±3.74); ConGr19.10 (±8.11); $p < 0.05$ (Cohen's d: 0.52). (iv) Confusion-bewilderment subscale: IntGr14.25 (±3.34); ConGr 16.47 (±4.74); $p < 0.05$ (Cohen's d: 0.54). Art therapy was not associated with the emotional approach coping style or level of spirituality.

Table 1: Continued.

Study author, year	Sample	Intervention: *content, duration, and frequency*	Outcome indicators: *Primary* [1] *Secondary* [2]	Scale	Main findings and effect sizes (*Cohen's d if applicable*)
Svensk et al., 2009 [29]	$N = 41$ IntGr (mean age 59) $n = 20$, ConGr (not described, mean age 55) $n = 21$	(i) Individual sessions of art therapy, phenomenological method (ii) 5 weeks (one session for 1 h/week)	Quality of life [1] General health [1]	WHOQOL-BREF EORTC-QLQ-BR23	After 6-month postintervention (WHOQOL-BREF mean score) art therapy was associated with improvement in (i) Overall quality of life: IntGr 85.00 (±12.57); ConGr 67.50 (±20.03); $p < 0.05$ (Cohen's d: 1.05). (ii) General health: IntGr 71.25 (±20.32); ConGr 55.00 (±23.79); $p < 0.05$ (Cohen's d: 0.73). (iii) Environmental domain: IntGr 74.69 (±8.54); ConGr 68.59; (±11.58); $p < 0.05$ (Cohen's d: 0.60).
Thyme et al., 2009 [30]	$N = 41$ (37–69 years). IntGr $n = 20$, ConGr (no intervention) $n = 21$	(i) Individual sessions of art therapy, phenomenological method (ii) 5 weeks (one session for 1 h/week)	Perceived self-image [1] Psychiatric symptoms [1] Psychosocial variables [2] Treatment modalities [2]	SASB SCL–90	After 4 months postintervention (SCL-90 means score) art therapy was associated with improvement in: (i) Depression symptoms: IntGr 0.22 (±0.21); ConGr 0.44 (±0.38); $p < 0.05$ (Cohen's d: 0.72). (ii) anxiety symptoms: IntGr 0.16 (±0.19); ConGr 0.40 (±0.39); $p < 0.05$ (Cohen's d: 0.78). (iii) Somatic symptoms: IntGr0.38 (±0.39); ConGr 0.72 (±0.66); $p < 0.05$ (Cohen's d: 0.63). (iv) General severity symptom: IntGr 0.19 (±0.16); ConGr 0.34 (±0.28); $p < 0.05$ (Cohen's d: 0.66).
Monti et al., 2012 [31]	$N = 18$ (52–77 years). IntGr $n = 8$, ConGr (educational support program) $n = 10$	(i) Group sessions of mindfulness-based art therapy (ii) 8 weeks (one session for 2.5 h/week).	Anxiety [1] Changes in resting in cerebral blood flow (CBF) [1]	SCL-90-R The fMRI imaging protocol	Art therapy was associated with observed effect on regional CBF in multiple brain areas: the left insula, right amygdala, right hippocampus, and bilateral caudate (structures involved in meditation tasks as well as emotional processing related to anxiety).
Monti et al., 2013 [32]	$N = 191$ (37–69 years). IntGr $n = 93$, ConGr (educational support program) $n = 98$	(i) Group sessions of mindfulness-based art therapy (ii) 8 weeks (1 time a week, duration not described).	Psychosocial stress [1] Stress-related somatic complaints [1] Health-related quality of life [1]	SCL-90-R SF-36 BSI-18	Art therapy was associated with improved overall outcomes in intervention group participants with high stress levels at baseline.

Table 1: Continued.

Study author, year	Sample	Intervention: *content, duration, and frequency*	Outcome indicators: *Primary* [1] *Secondary* [2]	Scale	Main findings and effect sizes (*Cohen's d if applicable*)
Jang et al., 2016 [33]	$N = 24$ (aged >50) IntGr $n = 12$, ConGr (waitlisted) $n = 12$	(i) Group sessions of mindfulness-based art therapy (ii) 12 weeks (one session for 45 min/week).	Depression [1] Anxiety [1] Quality of life [1]	PAI: Anxiety and depression subscales EORTC-QLQ-C30	Immediate postintervention art therapy (PAI mean score) was associated with improvement in (i) Depression symptoms: IntGr 51.58 (8.29); ConGr 71.50 (±9.07); $p < 0.05$ (Cohen's d: 2.29). (ii) Anxiety symptoms: IntGr 44.67 (±5.12); ConGr 64.67 (±9.77); $p < 0.05$ (Cohen's d: 2.56). Art therapy (EORTC-QLQ-C30 mean score) was associated with increased quality of life. Global health status: IntGr 81.31 (±12.46); ConGr40.17 (±19.37); $p < 0.05$ (Cohen's d: 2.53).
Jalambadani and Borji, 2019 [34]	$N = 124$ (40–60 years). IntGr $n = 50$, ConGr (waitlisted) $n = 50$	(i) Group mind-focused art therapy (ii) 12 weeks (one session for 90 min/week)	Quality of life [1]	WHOQOL-BREF	Immediate postintervention art therapy (WHOQOL-BREF mean score) was associated with improvement in (i) Physical health: IntGr 17.19 (±3.55); ConGr 11.72 (±3.08); $p < 0.05$ (Cohen's d: 1.64). (ii) Psychological health: IntGr 18.14 (±2.35); ConGr 21.80 (±15.98); $p < 0.05$ (Cohen's d: 0.32). (iii) Social relationship domain: IntGr 13.54 (±1.12); ConGr 18.97 (±8.84); $p < 0.05$ (Cohen's d: 0.86). (iv) Environment domain: IntGr 16.10 (±1.87); ConGr 14.17 (±2.17); $p < 0.05$ (Cohen's d: 0.95).

Table 1: Continued.

Study author, year	Sample	Intervention: *content, duration, and frequency*	Outcome indicators: *Primary* [1] *Secondary* [2]	Scale	Main findings and effect sizes (*Cohen's d if applicable*)
Czamanski-Cohen et al., 2019 [35]	$N = 20$ (36–70 years). IntGr $n = 10$, ConGr (SHAM art therapy) $n = 10$	*IntGr:* (i) Group art therapy (ii) 8 weeks (one session for 90 min/week) *ConGr:* (i) Group SHAM art therapy (mandala painting) (ii) 8 weeks (one session for 1 h/week)	Emotion processing [1] Depressive symptoms [1] Physical symptoms [1]	The levels of emotional awareness scale The acceptance of emotions scale (AE) CES-D BCPT	Immediate postintervention art therapy was associated with improvement in (i) Acceptance of emotions (AE mean score): IntGr 95.00 (±18.10); ConGr 103.00 (±12.11); $p < 0.05$ (Cohen's d: 0.52). (ii) Depressive symptoms (CES-D mean score): IntGr 8.0 (±2.9); ConGr 22.7 (±15.0); $p < 0.05$ (Cohen's d: 1.36). (iii) Emotional awareness (the levels of emotional awareness scale mean score): IntGr 30.00 (±3.37); ConGr 21.20 (±6.54); $p < 0.05$ (Cohen's d: 1.69).

[×] IntGr: intervention group; ConGr: control group.

the increase in the quality of life in the art therapy group. The effect of art therapy on the quality of life was evaluated in three more RCTs showing significant improvement in physical health, psychological, social, and environmental aspects in art therapy group without changes in the control group [34] and positive changes overall specific to cancer health [33], whereas one study revealed no significant between-group changes in overall quality of life, except in high stress level cancer patient subgroup where MBAT was shown to be significantly more effective [32]. The same nonsignificant effect in between-group comparison of MBAT was found in terms of psychosocial stress [32]; however, previous study with comparison to waitlist control group revealed significant improvements in psychosocial stress and quality of life [31]. The positive effect of art therapy on breast cancer patients quality of life has been also shown by earlier research [29] together with significant effect of art therapy on increased total health or more favorable body image or future perspectives. Initial research in this specific area started in 2006 with studies in general evaluating the effect of art therapy on participants' coping resources [27, 28]. None of them found statistically significant effect of art therapy in terms of emotional coping or enhancement of level of spirituality [28]; however, art therapy was shown to have a significant effect on social coping domain [27] and was associated with increased psychological well-being in terms of tension, anxiety, or anger reduction [28]. The effect of art therapy on psychological health was also shown by another study [30] demonstrating the long-term effect of art therapy on significant lowering of depression, anxiety symptoms and less general health symptoms. Based on this 2019 systematic literature review on the efficacy of art therapy in breast cancer patients, some important issues should be noted. Firstly, studies use broad and nonspecific definitions of art therapy and include various perspectives and activities under art therapy category. Even though art therapy should be addressed as a form of psychotherapy with special attention to the use of visual art-makings for emotion expression [48], others state that this is a term for therapies that involve not only visual art, but also music, dance, poetry, and drama [49, 50]. Moreover, some researchers name the art therapy as "creative arts therapy" [28] although it is described as traditional art therapy session with the usage of various painting and drawing supplies and tablets to explore the patient's emotional expression and improve psychological well-being. Usage of different terminology and lack of clear explanation of interventions applied may lead to improper classifications of studies in systematic reviews and may induce misinterpretation of effect results in meta-analysis (e.g., [51]). Second, randomized controlled trials in breast cancer show variety in outcome measure, ranging from depressive symptoms, quality of life or physical symptom measurement [33–35], psychological well-being and emotional coping variations [28], self-image or psychiatric symptoms [30] to changes in cerebral blood flow and anxiety [31]. Taking into consideration the array of different outcome measures, the real effect of art therapy in breast cancer setting may remain vague; therefore, more RCTs are needed to clarify the art therapy effect in this specific sample. Third, this systematic review shows a lack of and slow study progress in art therapy in breast cancer section. The previous systematic review on the efficacy of art therapy on mental health outcomes among breast cancer patients [24] resulted in 6 RCTs identified, as this systematic review resulted in 9

Table 2: Reviewed studies in music therapy according to sample, intervention, outcomes, and main findings.

Study author, year	Sample	Intervention: *content, duration and frequency*	Outcome indicators: *Primary* [1] *Secondary* [2]	Scale	Main findings and effect sizes *(Cohen's d if applicable)*
Hanser et al., 2006 [36]	$N = 70$ (26–77 years). IntGr $n = 20$, ConGr (usual oncology and supportive care) $n = 22$	(i) Individual sessions with music therapist (ii) Up to 15 weeks (three 45 min sessions)	Quality of life [1] Psychological distress [1] Cardiovascular arousal [2] Relaxation, comfort, mood [2]	FACT-G plus FACIT-Sp subscale HADS VAS	No significant differences in quality of life or psychological distress observed. Music therapy was associated with improvement in secondary outcomes immediate after sessions: relaxation, comfort, happiness, heart rate ($p < 0.05$).
Bulfone et al., 2009 [37]	$N = 60$ IntGr (mean age 49.2 ± 6.9) $n = 30$, ConGr (standard assistance, mean age 52.7 ± 6.1) $n = 30$	(i) Listening to pretaped and recorded music in earphones (ii) 15 min of music listening while waiting for the call for chemotherapy	Anxiety [1]	STAI-Y	Immediately after music therapy (STAI-Y mean score) reduction in anxiety state ($p < 0.05$) was observed.
Binns-Turner et al., 2011 [38]	$N = 30$ (42–70 years). IntGr $n = 15$, ConGr (standard care) $n = 15$	(i) Listening to pretaped music in the perioperative period (ii) Duration not described	Anxiety [1] Hemodynamics [1] Pain [1]	SAI VAS	Postoperatively music therapy (SAI mean score) was associated with improvement in (i) Levels of MAP : IntGr 83.6 (±13.0), ConGr 96.6 (±14.3); $p < 0.05$ (Cohen's d: 0.95). (ii) Anxiety symptoms: IntGr 30.7 (±12.3), ConGr 49.7 (±18.9); $p < 0.05$ (Cohen's d: 1.19). (iii) Pain symptoms: IntGr 41.5 (±30.2), ConGr 64.9 (±20.9); $p < 0.05$ (Cohen's d: 0.90).
Li et al., 2012 [39]	$N = 120$ (25–65 years) IntGr $n = 60$, ConGr (routine nursing care/no intervention) $n = 60$	(i) Self-selected music from preselected 202 items through MP3 player (ii) Listening to music twice a day (30 min per session), in the morning and in the evening	Pain [1]	SF-MPQ (including PRI-Total, VAS, PPI) General questionnaire	Music therapy (PRI-total mean score) was associated with improvement in pain symptoms in three measured time points: (i) The day before discharge from hospital: IntGr 2.25 (±1.17); ConGr 4.70 (±1.50); <0.05 (Cohen's d: 1.82). (ii) The second time of admission to hospital for chemotherapy: IntGr 1.72 (±1.32); ConGr 4.17 (±1.34); $p < 0.05$ (Cohen's d: 1.84). (iii) The third time of admission to hospital for chemotherapy: IntGr 0.71 (±0.69); ConGr 2.62 (±0.96), $p < 0.05$ (Cohen's d: 2.28).

Table 2: Continued.

Study author, year	Sample	Intervention: *content, duration and frequency*	Outcome indicators: *Primary* [1] *Secondary* [2]	Scale	Main findings and effect sizes *(Cohen's d if applicable)*
Li et al., 2012 [39]	As above	As above	Anxiety [1]	SAI General questionnaire	Music therapy (SAI mean score) was associated with improvement in anxiety in three measured time periods: (i) The day before discharge from hospital after radical mastectomy: IntGr 37.77 (±5.96), ConGr 42.35 (±6.09); $p < 0.05$ (Cohen's d: 0.76). (ii) The second time of admission to hospital for chemotherapy: IntGr 34.39 (±4.26); ConGr 43.10 (±6.07); $p < 0.05$ (Cohen's d: 1.66). (iii) The third time of admission to hospital for chemotherapy: IntGr 30.87 (±2.71); ConGr 40.35 (±4.44); $p < 0.05$ (Cohen's d: 2.58).
Zhou et al., 2011 [40]	As above	As above	Depression [1] Duration of hospital stay [1]	ZSDS General questionnaire	Music therapy (ZSDS mean score) was associated with improvement in depression in three measured time periods: (i) The day before discharge from hospital after radical mastectomy: IntGr 32.20 (±4.73), ConGr 35.76 (±5.80); $p < 0.05$ (Cohen's d: 0.67). (ii) The second time of admission to hospital for chemotherapy: IntGr 30.00 (±4.89); ConGr 35.50 (±4.90); $p < 0.05$ (Cohen's d: 1.12). (iii) The third time of admission to hospital for chemotherapy: IntGr 25.67 (±2.74); ConGr 32.15 (±3.86); $p < 0.05$ (Cohen's d: 1.93).
Romito et al., 2013 [41]	$N = 62$ (25–65 years) IntGr $n = 31$, ConGr (standard psychosocial care) $n = 31$	(i) Integrated group intervention of music therapy and emotional expression. (ii) Single session (2.5 h)	Stress [1] Anxiety [1] Depression [1] Anger [1] "Need for help" variable [1]	"Emotion thermometers tool"	Postintervention music therapy ("Emotion thermometers tool" mean score) was associated with improvement in stress, anxiety, depression, and anger ($p < 0.05$) in the experimental group.

Table 2: Continued.

Study author, year	Sample	Intervention: *content, duration and frequency*	Outcome indicators: *Primary* [1] *Secondary* [2]	Scale	Main findings and effect sizes *(Cohen's d if applicable)*
Palmer et al., 2015 [42]	$N = 201$ (mean age 59.4 ± 15.7) IntGr-1 (live music) $n = 69$, IntGr-2 (recorded music) $n = 68$, ConGr (usual care) $n = 65$	(i) IntGr-1: listening to 5 min live singing preoperatively. Later—listening to recorded music. (ii) IntGr-2: Listening to 5 min recorded music. Later—as IntGr-1.	Anesthesia requirements [1] Anxiety [1]	GA-VAS	Music therapy (GA-VAS mean score) was associated with improvement in anxiety symptoms: (i) Live music group versus control: IntGr 40.7 (±36.7); ConGr 57.0 (±46.9); $p < 0.05$ (Cohen's d: 0.39). (ii) Recorded music group versus control: IntGr 38.0 (±32.5); ConGr 57.0 (±46.9); $p < 0.05$ (Cohen's d: 0.47).
Moradian et al., 2015 [43]	$N = 99$ (27–82 years) IntGr-1 (Nevasic group) $n = 34$. IntGr-2 (music group) $n = 32$, ConGr (no intervention) $n = 33$	(i) Listening to pretaped Nevasic music (IntGr-1) or other preselected music (IntGr-2) for 27 min once feelings of nausea/vomiting occur. (ii) 6 days	Frequency and duration of nausea and amount of vomiting [1] Quality of life [2]	Rhodes index of nausea, vomiting and retching (INVR) EORTC-QLQ-C30 EORTC-QLQ-BR23	Music therapy was not associated with frequency or duration of nausea and vomiting experiences.
Karadag et al., 2019 [44]	$N = 60$ (mean age 59.40 ± 13.28 years) IntGr $n = 30$, ConGr (no intervention) $n = 30$	(i) Pretaped and recorded music on MP3 player (ii) 5 weeks (5 times a week for 20–40 min)	Anxiety [1] Depression [2] Comfort level [1]	HADS RTCQ questionnaire for sociodemographic and disease characteristics	Music therapy (HADS mean score) was associated with improvement in (i) Anxiety symptoms: IntGr 5.20 (±2.83), ConGr 8.59 (±3.30); $p < 0.05$ (Cohen's d: 1.10). (ii) Depression symptoms: IntGr 4.13 (±1.85); ConGr 8.33 (±4.02); $p < 0.05$ (Cohen's d: 1.34). Music therapy (RTCQ mean score) was associated with improvement in comfort levels: IntGr 119.03 (±11.90); ConGr 96.53 (±16.64); $p < 0.05$ (Cohen's d: 1.55).
Hsieh et al., 2019 [45]	$N = 60$ IntGr $n = 30$ (mean age 52.2 ± 9.88), ConGr (active, listened ambient music, mean age 56.9 ± 10.68) $n = 30$	(i) Pretaped and recorded music on MP3 player (ii) 24 weeks (five 30 min sessions per week)	Symptom severity [1] Pain intensity [2] Perceived fatigue [2]	TRSC NRS-101 MFSI-SF-C	Music therapy (TRSC mean score) was associated with improvement in symptom severity, pain intensity, and fatigue ($p < 0.05$) after 6, 12, and 24 weeks of intervention.

[x]IntGr: intervention group; ConGr: control group.

RCTs regarding the issue evaluated. Even though methodological variations across these identified studies were huge, it should be stated that there is uncountable positive impact of art therapy on overall psychological and physical state of breast cancer patients.

4.1.2. Music Therapy. Music therapy is a health discipline that involves using music and conducting musical activities to treat individuals with specific physical, emotional, cognitive, and social needs [26]. Goals in music and medicine in general may be summarized according to the following:

elimination of stress and anxiety; elimination of pain; elimination of depression, helplessness; and enhancement of immune functioning [52]. Due to the effects on psychological and some physiological states' management, music therapy is also recognized as a complementary, evidence-based treatment in oncology setting and, in general, aims to increase relaxation and calmness [53].

Results of this systematic review indicate that music therapy was mostly researched for anxiety reduction targets and was predominantly carried out during chemotherapy/radiotherapy course or in preoperative, perioperative, or postoperative period. For example, listening to music stored onto the MP3 players two times a day (for 30 min) following radical mastectomy and the two chemotherapy periods reduced anxiety [54]. Further, significant reduction in anxiety scores was reached with music therapy intervention during the waiting for chemotherapy time. Listening for tapped musical themes for 15 min before chemotherapy session reduced breast cancer patient's anxiety, while anxiety increase was observed in the intervention free control group [37]. Preoperative anxiety was also significantly lowered and after music therapy applied before surgery [42]. Moreover, listening intervention applied during radiation therapy not only significantly decreased anxiety and depression, but also increased comfort status of the women receiving treatment [44].

The effect of reducing negative emotions during the administration of chemotherapy in terms of stress, depression, anxiety, and anger was reached after single group session of music therapy and emotional expression (lasting 2.5 hours) [41]. Similar results were shown after 45-minute lasting music therapy sessions (3 times) with significant improvements in reported comfort, relaxation, and happiness and lowered physiologic stress arousal (decreased heart rate). However, the observed results show immediate effect; no significant differences at psychological distress were found over time [36]. In another study, music therapy also was associated not only with reduced depression, but also with reduced duration of hospital stay after radical mastectomy [40].

Another focus of music therapy in breast cancer patient group lays on pain management. Perioperative music therapy was proven to be an effective intervention for pain management (as well as anxiety reduction) [38]. These findings are consistent with another RCT indicating pain reduction effect of music therapy after surgery [39]. Recent study showed that even home-based music therapy may have lasting effect (up to 24 weeks) not only on pain intensity, but also on overall and general fatigue, emotional fatigue, and vigor [45]. Besides anxiety or depression evaluation, two studies also measured the effect of music therapy on nausea and vomiting [43] and sedative requirements [42], but could not confirm associations between them. Despite being statistically significant, less use of antiemetics after listening to Navastic music was indicated [43].

Overall, our analysis of the research studies on music therapy interventions during the treatment of breast cancer patients, including surgical, chemotherapeutic, or radiotherapeutic treatments, indicates their effects on the following outcomes: anxiety, depression, stress, pain, and quality of life. Music intervention is significant for its convenience, noninvasiveness, and high applicability. Musical intervention can be performed anywhere and it does not require costly, technologically advanced equipment. However, substantial diversity was found among these studies. The different methodologies and different timing are the main reasons for the diversity. Because of the limitations of existing studies, there is a need for future music intervention research.

4.2. What Do We Need to Find Out?

4.2.1. Art Therapy. Results of this systematic review show that art therapy is an efficient and promising method in the alteration of breast cancer patient physical and emotional health. However, there is a huge diverseness of evidence across trials due to variation not only in study components (number or respondents, amount and duration of intervention sessions, and individual vs. group intervention), but also in measures used to assess outcomes (e.g., cancer-related health or quality of life vs. general health or quality of life, etc.). Moreover, with the purpose to reveal clear effect of art therapy, there is a need to use intervention absent control group and our systematic review shows that 3 of 9 used other intervention group as a control group and both reveal positive effects for cancer patient group. Even more importantly, one of the studies found no significant differences between groups [32]; therefore, the effect of art therapy becomes even more vague. Heterogeneity across intervention methods also limits the investigation of the true effect of art therapy as there is no generally accepted standards or guidance ruling the implementation of art therapy, therefore decreasing the repeatability and reliability of the studies. Consequently, there is a need for highly descriptive and sophisticated RCT with outcome measures that are most in line with this specific breast cancer theme.

4.2.2. Music Therapy. Since music therapy has no national or international guidelines, the main problematic area is variety and knowledge interpretation in many aspects, starting from description and identification of the music therapy and finishing with application details. First of all, as this systematic review shows, music therapy has many names: "music intervention," "music listening intervention," "home-based music intervention," "preoperative music," etc. Their variety of definitions of interventions applied leaves theoretical misunderstanding in the most basic level—whether listening for tapped music on MP3 player is a music therapy? If not, then what researchers are evaluating, the effect of listening to songs or just a result of music as a distracting object, which could be replaced, e.g., by movie watching? Further, many RCTs have shown positive effect of music therapy/intervention/listening to elevating psychological distress in general, but they differed in performance

greatly. Some of them were studying only listening music on MP3 (or other device), while some music intervention were implemented with music therapist or clinical psychologist; other therapists even sang to patients, while in other studies patients sang themselves. Despite that, studies evaluated also revealed a great variety in duration of music therapy overall and single time, the variety and no scientific agreement among pieces of music used for music therapy, and differences in the music selection nature (e.g., prepared by researcher or selected by patient). Taking into account sample size issues (some of studies used relatively small sample), inaccuracies in determining the short- versus long-term effect, and significant differences in application, there is a clear need for more studies of high methodological quality with reasonable and systematic description of interventions applied.

Several limitations in this study should be considered and caution should be taken in the interpretation of the findings: first, due to the small RCT number in the area of art and music therapies in breast cancer group; second, due to the heterogeneity of therapy methods and outcomes involved, since all studies involved in this systematic review combine their own methodology, time, and number of therapies overall.

5. Conclusion

This systematic review provides a comprehensive overview of the relationship between art and music therapies and biopsychosocial outcomes on patients with breast cancer. The main results demonstrated that both therapies are effective in the reduction of negative emotional states (e.g., anxiety, depression, or psychological distress level), increase quality of life, and may reduce pain and fatigue related to cancer treatment. More studies, especially focusing on expressively described and scientifically based research methodology, are needed to increase the confidence levels of our findings.

Additional Points

Breast cancer is the most often diagnosed cancer in women and needs an integrative oncology approach in order to reach the best physical and psychological outcomes. Medical advances prolonged survival; however, breast cancer diagnosis and treatment induce long-term mental health difficulties. The scientific interest in contemporary and alternative medicine in oncology settings has greatly increased during recent years and is widely used to reduce mental distress and enhance the quality of life. Art and music therapies are a safe alternative approach in breast cancer treatment.

Conflicts of Interest

The authors declare that they have no conflicts of interest regarding the publication of this paper.

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