


# Impact of a Music Intervention on Quality of Life in Breast Cancer Patients Undergoing Chemotherapy: A Randomized Clinical Trial

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## Abstract

**Background:** Music can influence human behavior and may be used as a complementary therapy in health care. **Objectives:** To assess the effect of music interventions on symptoms, adverse events, and quality of life (QoL) of breast cancer patients undergoing chemotherapy (CT). **Design:** Nonblinded, randomized clinical trial. Women with breast cancer undergoing adjuvant CT were randomized into 2 groups—Group Music (GM) or Group Control (GC)—and followed during the first 3 cycles of treatment. **Measurements:** Sociodemographic data, WHOQOL-BREF, BDI-II, BAI, and Chemotherapy Toxicity Scale were assessed. Patients were evaluated after each session of the first 3 CT cycles. GM underwent a 30-minute musical intervention before CT. There was no intervention in the GC. Continuous data were analyzed by Student's *t* test, and  $\chi^2$  test was used to compare qualitative variables. **Results:** Higher QoL scores on functional scales were observed for the GM in comparison to the GC after the first and third sessions of CT. Depression ( $P < .001$ ) and anxiety scores ( $P < .001$ ) and vomiting ( $P < .01$ ) incidence were lower for the GM in the third session of CT. All the participants in the GM reported positive changes in life in the Subjective Impression of the Subject questionnaire, as well as improvement in fatigue and reduced stress levels. **Conclusions:** Improvements in QoL, anxiety, depression, and incidence of vomiting were associated with the music intervention, suggesting a positive effect of the music intervention on adverse events of cancer CT.

## Keywords

breast cancer, music, integrative medicine

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## Background

Common side effects of chemotherapy include nausea, vomiting, hair loss, and diarrhea. Additionally, patients undergoing long treatment frequently experience hospitalizations. Inappropriate control of adverse events can significantly reduce an individual's quality of life (QoL) and affect daily life activities. The knowledge of being diagnosed with cancer may affect the mental health of these patients.<sup>1-3</sup> During the treatment course, psychological side effects, including distress and anxiety, arising from this context,

may induce paralyzing and fearful thoughts after being aware of cancer diagnosis and prognosis, disease symptoms, and side effects of chemotherapy.<sup>4,7</sup>

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Decreased physical and functional well-being of patients directly compromise QoL. In turn, this affects psychological and social functioning, leading to a cascade of psychosocial and even spiritual needs that should be addressed.<sup>8</sup> Patients may develop a fear of mutilation, prejudice, and death, which can result in depression.<sup>4</sup> In recent years, there has been an increasing body of research addressing health-related QoL measures, taking into account the impact of breast cancer diagnosis, treatment of side effects, and therapeutic interventions to alleviate patients' suffering.<sup>9-24</sup>

Music interventions, including music therapy (MT), may help by activating the cortical region of the brain, promoting emotional coping with the intense feelings and stress that arise in each chemotherapy session.<sup>25-27</sup> Well-known movie music tracks that have been used in a previous study demonstrated benefits in controlling symptoms and quality of life.<sup>17</sup>

Ten to 15 minutes of music listening elevates the regulation of the autonomic nervous system, as evidenced by changes in heart rate variability.<sup>28</sup> MT during the treatment of adult cancer patients can decrease the perception of pain, nausea, vomiting, fatigue, and stress, which usually result from chemotherapy and radiotherapy, and may be associated with physical discomfort.<sup>9</sup>

Previous studies with different methods have evaluated the effect of MT after breast biopsy,<sup>10,11</sup> mastectomy,<sup>12</sup> and radiotherapy for breast cancer diagnosis and treatment,<sup>9,13</sup> demonstrating a reduction of patients' discomfort with the procedures, improvement in anxiety, and depression scores.<sup>10-13</sup>

Few studies have addressed the effect of music interventions during chemotherapy for breast cancer<sup>14-19</sup> or other types of cancer.<sup>20-24</sup> This randomized study aimed to assess the effects of a standardized music intervention combined with relaxation and breathing techniques on symptoms, adverse events, and QoL of breast cancer patients undergoing chemotherapy using sensitive instruments to assess anxiety, depression, and QoL scores, and an adapted subjective questionnaire, with objective and open questions to account for patients' feelings toward the music intervention and their perception of its effects.

## Method

### Study Design

This was a prospective, nonblinded, randomized clinical trial comparing the effects of the music intervention on the incidence of symptoms, adverse events, and QoL among female breast cancer patients undergoing chemotherapy.

### Participants

Female patients 18 years of age or older, with an Eastern Cooperative Oncology Group (ECOG) score  $\leq 2$ ,<sup>29</sup> initiating adjuvant chemotherapy for breast cancer with a doxorubicin

and cyclophosphamide protocol (AC protocol) at 2 reference hospitals for the treatment of cancer (Aldenora Bello Hospital and São Domingos Hospital) in São Luis, Maranhão, were included. Patients diagnosed with metastatic disease, submitted to previous chemotherapy, or with an ECOG score  $\geq 3$  were excluded.

### Music Intervention

The music intervention was performed using a preselected playlist organized by the researchers, with relaxing music including classical, traditional works containing slow, consistent rhythmic, melodic instrumental pieces, and well-known movie music tracks that have been used in a previous study and demonstrated benefits in controlling symptoms and quality of life.<sup>17</sup> The playlist contained classic music (*River Flows in You, Heart, Far Away—Yiruma, Ave Maria, S.558/12* by Franz Schubert/Franz Liszt—Lang Lang, *Hello/Lacrimosa—The Piano Guys*) and movie music tracks (*An Angel Falls* by Sarah McLachlan—City of Angels, and *The Ocean of Memories—Titanic*).

### Instruments

The evaluation consisted of an approximately 30-minute interview after the completion of each cycle of chemotherapy, through self-administered and interviewer-administered instruments. Participants were informed of this methodology before informed consent. Sociodemographic variables were collected through a questionnaire developed for this study. Anxiety, depression, and QoL were assessed through a validated Brazilian Portuguese Version of the Beck Anxiety Inventory (BAI),<sup>30,31</sup> Beck Depression Inventory—2nd ed (BDI-II),<sup>31,32</sup> and World Health Organization Quality of Life (WHOQOL)-BREF questionnaire,<sup>33</sup> respectively. Symptoms and adverse events related to chemotherapy were measured through the Chemotherapy Toxicity Scale (Common Terminology Criteria for Adverse Events—CTCAE), including fatigue, nausea, vomiting, diarrhea, mucositis, myalgia, and alopecia.<sup>34</sup> Participants answered the adapted Subjective Impression of the Subject (SIS) questionnaire to qualitatively assess the effects of the music intervention.<sup>35</sup>

The BAI consists of 21 items, which are descriptive of anxiety symptoms, with a Likert-type scale ranging from 0 to 3 and raw scores ranging from 0 to 63. The BAI scores are classified as minimal anxiety (0-7), mild anxiety (8-15), moderate anxiety (16-25), and severe anxiety (30-63).<sup>30,31</sup>

The BDI-II consists of 21 sets of statements about depressive symptoms in the past 15 days that are rated on a 0-to-3 ordinal scale, yielding total scores ranging from 0 to 63. The suggested thresholds for levels of severity were as follows: 0 to 13, minimal/no depression; 14 to 19, mild depression; 20 to 28, moderate depression; and 29 to 63, severe depression.<sup>31,32</sup>

The WHOQOL-BREF is grouped into 4 domains of QoL (physical health, psychological health, social relationships, and environment) and 2 items that measure overall QoL and general health. All domain scores are reported between 4 and 20.<sup>33</sup>

The adapted SIS consists of 9 items aimed at verifying the perception of the patients about the results after the music intervention, such as positive and negative changes related to the music intervention, stress and fatigue levels, scored between 0 and 10 and how they describe the effect of the music intervention.<sup>35</sup>

### Procedures

Randomization was performed by the computer Randomizer Program using sealed brown envelopes prepared before data collection. Each envelope contained a group name. One envelope was drawn for each patient on the day of the first chemotherapy to assign a patient study group. Patients and investigators were aware of the assigned group. All patients underwent evaluation of chemotherapy symptoms and adverse events, anxiety, depression, and QoL scores, and SIS questionnaire, as described above.

Participants were evaluated at 3 different time points: (1) Initial phase: an initial interview with the application of the Informed Consent Form, randomization and application of the sociodemographic form, BDI-II, BAI, WHOQOL-BREF questionnaires, and the first session of chemotherapy; (2) Intermediate phase (after the second chemotherapy session): application of the CTCAE questionnaire, only; (3) Final phase (after the third chemotherapy session): application of SIS, BDI-II, BAI, WHOQOL-BREF, and CTCAE questionnaires.

In the Group Control (GC), participants received verbal instructions for self-relaxation techniques but did not undergo the music intervention.

In the Group Music (GM), the music intervention was applied using an MP3 headphone device for 30 minutes immediately before chemotherapy, and they did not potentially hear other disturbing noises in the environment. Bulfone et al<sup>17</sup> described the positive effects of music offered during this period. The volume level was adjusted by the participant. Before the musical stimulus, participants received verbal guidance for self-relaxation techniques. A researcher instructed each participant to direct her attention to her breathing pattern for about a minute, closing her eyes, inhaling deeply, and exhaling through the mouth. Then, the MP3 player was applied to start the music intervention.<sup>36</sup>

### Power Calculation

For a statistical power of 95%, with a sampling error of 5% and an estimated 58.86% prevalence of adverse effects (nausea) associated with chemotherapy,<sup>37</sup> a final sample of

33 patients was estimated. It was estimated that 60 patients meeting inclusion criteria would be treated in both hospitals during the year of 2018.

### Statistical Analysis

Data were tabulated in the Microsoft Office Excel (version 2013) program and analyzed by the statistical program SPSS (version 22). Normality was assessed by the Shapiro-Wilk test for continuous data. All continuous data met the normality test criteria and were analyzed by Student's *t* test. Data are presented as absolute and relative frequencies.

Student's *t* test was used to analyze age, time since diagnosis, and BDI-II, BAI, and QoL (WHOQOL-BREF questionnaire) scores between study groups and between different time points within the same group. Chi-square test was used to compare qualitative variables, including skin color, marital status, professional activity, lifestyle characteristics (physical activity, alcohol intake, and smoking habit), family income, and tumor staging. Data are shown in tables and graphs. An  $\alpha$  significance level of .05 or less was used for all statistical associations.

### Ethics Statement

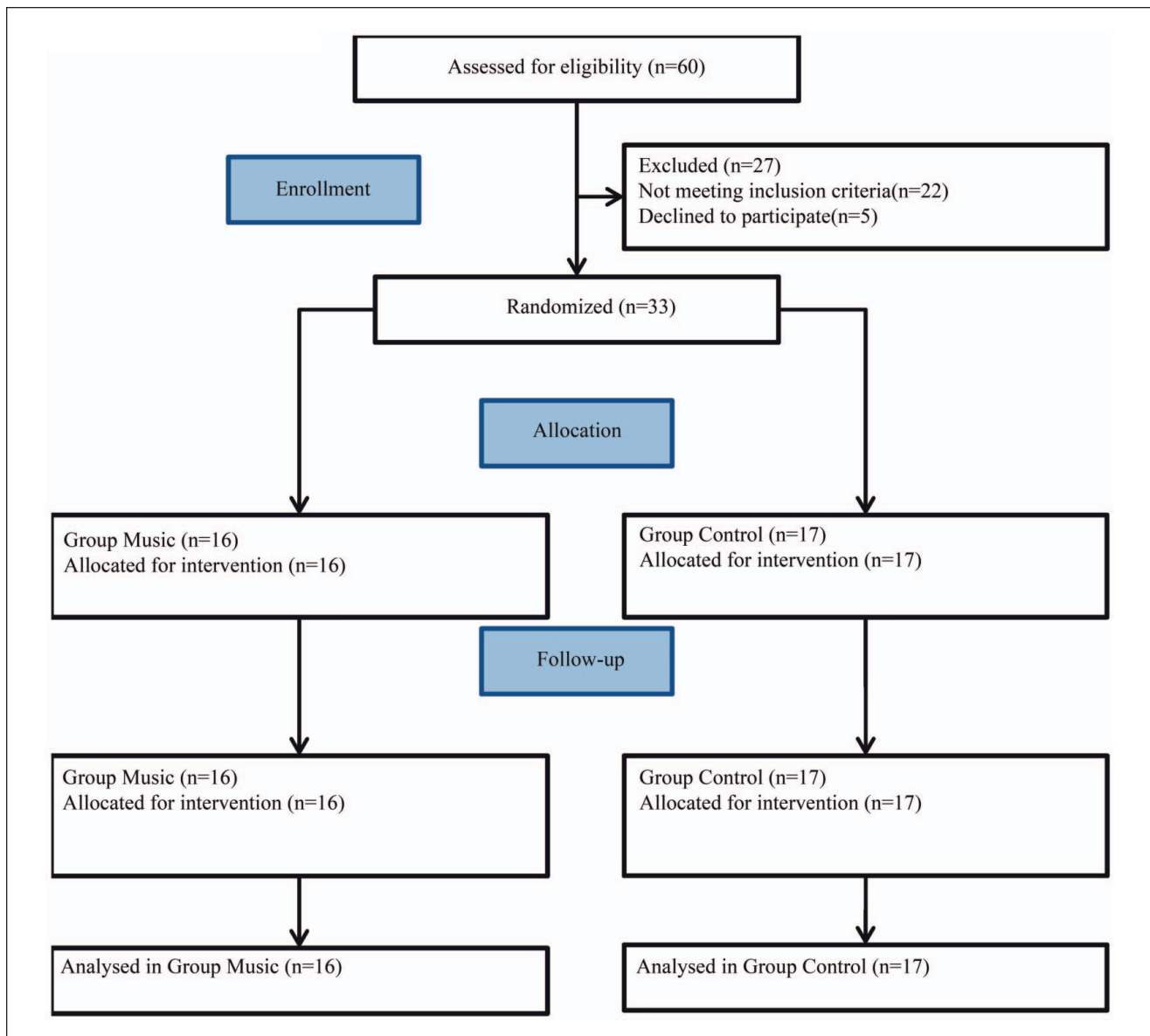
This study was submitted to the Research Ethics Committee of Hospital São Domingos and started after its approval under the Number 2200480. The study was registered in the Brazilian Registry of Clinical Trials under number RBR-88r347 and was conducted following the ruling principles of the Helsinki Convention. All participants were volunteers and signed Informed Consent Form before inclusion, after understanding study objectives, possible adverse events, and benefits. All rights of the respondents were safeguarded through the Informed Consent Form.

### Results

Sixty patients were initially assessed, and 33 were randomized into the study groups: 16 were allocated in the GM and 17 in the GC. Figure 1 shows the CONSORT diagram with exclusions, dropouts, losses, and total patients for analysis.

Baseline characteristics, including demographic and social variables (age, skin color, marital status, professional activity, and family income), lifestyle habits (alcohol intake, smoking, and physical activity), time since diagnosis, and tumor staging was similar between the study groups (Table 1).

Higher QoL scores on the functional scale were observed for the intervention group in comparison to the GC when assessed after the initial phase and the final phase (Table 2). There was no statistical difference when comparing each group to itself at different time points (first and third chemotherapy sessions).



**Figure 1.** Study flowchart.

Depression scores were significantly lower for the GM at the final phase assessment (Table 3). Although depression scores were numerically lower in GM compared with GC at the initial phase, this was not statistically significant. There was a statistical difference when comparing the GM at the initial and final phases (reduction of depression scores), but no difference was seen for the GC at different time assessments.

Anxiety scores were lower in the GM ( $P < .001$ ) at the final phase (Table 4). Although anxiety scores were numerically lower in the GM compared with the GC at the initial phase, it did not reach statistical significance ( $P = .177$ ). There was no statistical difference for the anxiety scores

within the GM nor the GC when comparing the initial to the final phase.

There was an increased incidence of vomiting after the final phase in comparison to the initial phase in both study groups, with a  $P$  value of .003 for the GM and .016 for the GC. For the comparison between study groups, the incidence of vomiting was lower for the GM compared with the GC at the final phase ( $P = .01$ ; Table 5). There was no statistical difference between groups nor within the same group at different time points for other symptoms and adverse events assessed (Table 5).

All participants in the intervention group reported positive changes with the music interventions through the

**Table 1.** Social Characteristics, Lifestyle, Family Income, Time Since Diagnosis, and Tumor Staging of Patients Submitted to AC Protocol (Doxorubicin and Cyclophosphamide) in GM and GC (N = 33)<sup>a</sup>.

Variables	GM (n = 16)	GC (n = 17)	P
Age <sup>b</sup> (years)	49.50 ± 10.65	50.76 ± 9.45	.72
Race <sup>c</sup>			
White	3	4	.22
Black	2	6	
Parda	11	7	
Marital status <sup>c</sup>			.09
Married	5	13	
Not married	5	2	
Divorced	3	2	
Widow	3	0	
Professional activity <sup>c</sup>			.58
Autonomous	8	10	
Retired	3	2	
Unemployed	5	3	
Away from work	0	2	
Alcohol intake <sup>c</sup>			.17
Yes	5	2	
No	11	15	
Smoking <sup>c</sup>			.58
Yes	1	2	
No	15	15	
Physical activity <sup>c</sup>			.22
Yes	9	6	
No	7	11	
Family income <sup>c</sup>			
≤2 minimum wage <sup>d</sup>	9	9	.84
≥3 minimum wage <sup>d</sup>	7	8	
Time of diagnosis <sup>b</sup> (months)	4.68 ± 3.32	4.88 ± 3.15	.86
Tumor staging <sup>c</sup>			
Grade I	5	2	.171
Grade II	11	15	

Abbreviations: GM, Group Music; GC, Group Control.

<sup>a</sup>Data are expressed as mean and standard deviation (t test) and absolute frequencies ( $\chi^2$ ).

<sup>b</sup>Student's t test.

<sup>c</sup>Chi-square test.

<sup>d</sup>Minimum wage was standardized in a mean of 963 Brazilian Real/month (approximately US\$250/month).

SIS questionnaire, including improvements in humor (6 patients), motivation (4 patients), self-confidence (2 patients), relationship (1 patient), relaxation (1 patient), stress level (1 patient), and self-esteem (1 patient). No negative symptoms were reported in association with musical intervention. All patients in the GM reported improvement in tiredness or fatigue (mean of 7.56 on a scale of 0-10), as well as improvement in stress levels (mean of 8.68 on a scale of 0-10). Besides, all participants reported positive changes related to the perception of the

music intervention, as well as talking about it to a friend and/or relative.

When asked to summarize the effect of the music intervention in one sentence, the phrases quoted were the following: "My support for keeping calm" (1 patient), "I took it as a treatment to stay well" (1 patient), "I learned to listen to a different music style to relax" (2 patients), "Tranquility at the time of treatment" (1 patient), "Good for the soul" (1 patient), "It makes me feel peaceful" (1 patient), "It makes me feel good" (3 patients), "No problem" (1 patient), and "I got relaxed" (5 patients).

## Discussion

This study demonstrated that the application of a standardized music intervention with a preselected playlist before each chemotherapy session reduced the incidence of chemotherapy-induced vomiting, anxiety, and depression scores, and improved QoL scores. Better control of other symptoms and adverse events that did not achieve statistical significance should not be disregarded since it could have influenced the perception of improved QoL in these patients.

Several studies assessing the influence of MT on breast cancer patients evidenced reduction of treatment adverse events, anxiety, and depression scores. However, most of the studies have been performed in patients undergoing other treatment procedures, such as breast biopsy,<sup>10,11</sup> surgery,<sup>12</sup> and radiotherapy.<sup>9,13</sup> Other studies included patients undergoing different chemotherapy protocols for various tumor types,<sup>20-24</sup> thus comparing heterogeneous groups. Few studies have focused on the effect of MT in female breast cancer patients undergoing chemotherapy,<sup>14-18</sup> and they have applied different MT methods.

A study by Romito et al<sup>14</sup> evaluated MT in breast cancer patients undergoing any adjuvant chemotherapy. Different from the present study, it applied a method of emotional expression through a vocal holding technique guided by a music therapist. Participants were instructed to sing their names and musical refrains that represented their own identity, followed by a verbal exploration of the emotions. They evidenced significant reductions in stress, anxiety, depression, and anger levels.

Bozcuk et al<sup>15</sup> used a preselected music program containing instrumental pieces of international classical music in nonmetastatic breast cancer patients, during chemotherapy with Adriamycin plus cyclophosphamide or cyclophosphamide, Adriamycin, and fluorouracil after modified radical mastectomy, attending an outpatient clinic of the medical oncology department during a 3-week study period. They did not show improvements in QoL, but there was a positive association between music interventions and age, showing improvements in insomnia and appetite loss in the older patient group.

**Table 2.** Quality of Life Assessment by the WHOQOL-BREF Questionnaire of Breast Cancer Patients Receiving AC Protocol (Doxorubicin and Cyclophosphamide) in GM or GC (N = 33)<sup>a</sup>.

Variables	GM (n = 16; 1 <sup>b</sup> )	GM (n = 16; 3 <sup>b</sup> )	Intragroup	GC (n = 17; 1 <sup>b</sup> )	GC (n = 17; 3 <sup>b</sup> )	Intragroup	Between groups (1 <sup>b</sup> )	Between groups (3 <sup>b</sup> )
General (Md ± Dp)	16.5 ± 1.7	15.9 ± 1.7	0.38 <sup>b</sup>	15.2 ± 1.7	14.3 ± 2.2	0.19 <sup>b</sup>	0.04	0.02

Abbreviations: GM, Group Music; GC, Group Control.

<sup>a</sup>Data are expressed as mean ± standard deviation.<sup>b</sup>Student's *t* test.**Table 3.** Beck Depression Inventory Scores of Breast Cancer Patients Receiving AC Protocol (Doxorubicin and Cyclophosphamide) in GM or GC (N = 33)<sup>a</sup>.

Variables	GM (n = 16; 1 <sup>b</sup> )	GM (n = 16; 3 <sup>b</sup> )	Intragroup	GC (n = 17; 1 <sup>b</sup> )	GC (n = 17; 3 <sup>b</sup> )	Intragroup	Between groups (1 <sup>b</sup> )	Between groups (3 <sup>b</sup> )
Depression (Md ± Dp)	18.7 ± 9.48	13.3 ± 4.2	0.04	21.0 ± 9.6	21.0 ± 6.4	0.98	0.50	0.001

Abbreviations: GM, Group Music; GC, Group Control.

<sup>a</sup>Data are expressed as mean ± standard deviation.<sup>b</sup>Student's *t* test.**Table 4.** Beck Anxiety Inventory Scores of Breast Cancer Patients Receiving AC Protocol (Doxorubicin and Cyclophosphamide) in GM or GC (N = 33)<sup>a</sup>.

Variables	GM (n = 16; 1 <sup>b</sup> )	GM (n = 16; 3 <sup>b</sup> )	Intragroup	GC (n = 17; 1 <sup>b</sup> )	GC (n = 17; 3 <sup>b</sup> )	Intragroup	Between groups (1 <sup>b</sup> )	Between groups (3 <sup>b</sup> )
Anxiety (Md ± Dp)	11.1 ± 9.7	5.9 ± 6.2	0.08	16.88 ± 13.7	20.1 ± 9.4	0.429	0.177	0.001

Abbreviations: GM, Group Music; GC, Group Control.

<sup>a</sup>Data are expressed as mean ± standard deviation.<sup>b</sup>Student's *t* test.

Lesiuk<sup>16</sup> reported a pilot study of MT in 15 nonmetastatic breast cancer patients undergoing any adjuvant chemotherapy. In this study, mindfulness-based MT was applied, consisting of sessions of varied music activities accompanied by mindfulness attitude or mental strategies that enhance moment-to-moment awareness, in weekly 1-hour sessions. They showed improved participants' attention and mood, in particular the perception of feeling fatigued.

Bulfone et al<sup>17</sup> performed a study of MT on breast cancer patients, stages 1 or 2, undergoing any adjuvant chemotherapy. They underwent a 15-minute MT session with a preselected playlist of new age, natural melodies, movie soundtracks, Celtic melodies, or classic music that was chosen by the patient before chemotherapy. Music interventions can reduce anxiety levels and directly and enhance the patients' sense of well-being and control.

A study by Chen et al<sup>18</sup> applied a 3-stage music intervention including relaxation, followed by music-listening and experience-sharing on the day of the first or second cycle of chemotherapy in breast cancer patients undergoing a total of six 3-weekly chemotherapy cycles. They demonstrated a

reduction in chemotherapy-related distress, negative emotions, and cognitive avoidance, improving the impact of anxiety, depression, and distorted cognition during and beyond chemotherapy.

Moradian et al<sup>19</sup> in a study of breast cancer patients undergoing chemotherapy applied a 6-day period of MT with a preselected music program or Nevasic through a CD player with headphones to be listened to once they had symptoms of nausea or vomiting during or after chemotherapy. Results showed a statistically significant reduction in the use of antiemetics ( $P = .003$ ) and a tendency to improved QoL ( $P = .06$ ).

Music is a "multifaceted, cultural, and social phenomenon, difficult to simplify into measurable test parameters in the complexity of cancer treatment," according to Bro et al.<sup>20</sup> To overcome the difficulty of measuring the effect of the music intervention in a complex scenario, such as cancer treatment, the present study focused on a homogeneous group of patients with the same cancer diagnosis, good performance status (ECOG 0-2) to reduce possible influence of individual performance over symptoms and adverse events, undergoing the same adjuvant chemotherapy protocol,

**Table 5.** Adverse Effects in Cancer Patients Undergoing AC Protocol (Doxorubicin and Cyclophosphamide) During 12 Weeks of Follow-up (N = 33)<sup>a</sup>.

	GM (n = 16; 2 <sup>b</sup> )				GM (n = 16; 3 <sup>b</sup> )				Intragroup (2 <sup>b</sup> )				GC (n = 17; 2 <sup>b</sup> )				GC (n = 17; 3 <sup>b</sup> )				Intragroup (3 <sup>b</sup> )		Between groups (2 <sup>b</sup> )		Between groups (3 <sup>b</sup> )	
	0	1	2	3	0	1	2	3	P	0	1	2	3	0	1	2	3	0	1	2	3	P	P	P	P	P
<b>Fatigue</b>	6	5	5	0	4	9	3	0	.564	8	6	3	0	9	8	0	0	.605	.838	.333						
<b>Nausea</b>	6	3	4	2	0	9	4	3	.108	0	8	4	5	2	6	4	5	.733	.099	.551						
<b>Vomiting</b>	14	2	0	0	6	10	0	0	.003	8	7	2	0	4	2	11	0	.016	.144	.010						
<b>Diarrhea</b>	13	3	0	0	13	3	0	0	1.000	15	2	0	0	12	5	0	0	.655	.958	.917						
<b>Mucositis</b>	16	0	0	0	16	0	0	0	1.000	17	0	0	0	17	0	0	0	1.000	1.000	1.000						
<b>Myalgia</b>	13	3	0	0	13	0	3	0	1.00	17	0	0	0	15	2	0	0	.771	.581	.457						
<b>Alopecia</b>	0	2	14	0	0	0	16	0	.769	0	5	12	0	0	0	17	0	.339	.703	1.00						

Abbreviations: GM, Group Music; GC, Group Control; Chemotherapy toxicity range: 0, no symptoms; 1, grade 1; 2, grade 2; 3, grade 3; 4, grade 4; the higher the grade, the worse the symptoms.

<sup>a</sup>Data expressed in absolute values.

<sup>b</sup>Chi-square test.

which also implies lack of active disease, limiting a possible influence of disease burden over symptoms and events. All participants of the intervention group received the same music intervention protocol.

The SIS questionnaire was applied, and it enabled taking into account patients' feelings toward the music intervention and their perception of its effects, with a positive association between mood improvement perception and the reduction of anxiety, depression, fatigue, and stress scores. The randomization process and the application of sensitive instruments to assess anxiety, depression, and QoL scores are further strengths of this study.

The lack of baseline assessment before the first chemotherapy cycle represents a limitation of the study due to time constraints. To optimize inclusion rates, the first application of the study instruments was performed only after the first treatment session. A greater or smaller effect of the intervention could be evidenced if baseline questionnaires had been applied. Another limitation was the lack of selection criteria based on initial anxiety levels or stratification according to its level, which could have found a differential effect in a more or less anxious subgroup. The lack of a longer follow-up beyond the third cycle of chemotherapy and the nonblinded nature of the study are also limiting.

In conclusion, integrative interventions in oncology can be applied through relatively simple and inexpensive strategies that may improve patients' experiences during cancer treatment. According to our findings, music interventions may contribute positively to the control of adverse events, anxiety, and depression and may be associated with better QoL in cancer patients undergoing chemotherapy.

### Declaration of Conflicting Interests

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