

# Impact of Nada Yoga Music Therapy on Anxiety and Quality of Life in Ovarian Cancer Patients: A Randomized Controlled Trial

## Abstract

**Background and Objective:** Nada yoga is a complementary therapy known for its potential to reduce anxiety. This study aimed to assess the effects of nada yoga music on anxiety management and quality of life (QoL) in ovarian cancer patients undergoing chemotherapy. **Materials and Methods:** In this randomized controlled trial, 58 ovarian cancer patients undergoing chemotherapy were recruited. Participants were randomly assigned into two groups using a simple randomization procedure: Group A (control arm): Participants in this group listened to nada yoga music without any additional instructions. Group B (intervention arm): Participants in this group listened to the same nada yoga music with additional verbal instructions for meditation. Nada yoga music was delivered to both groups through a custom Android application developed for this study. Follow-up assessments were conducted every 3 weeks, and anxiety levels were measured using the Hamilton Anxiety Rating Scale, whereas QoL was assessed using the EORTC QLQ (European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire)-C30 QoL questionnaire. Baseline data were collected just before the first chemotherapy session, and post data were collected after 12 weeks. **Results:** Data from 49 participants were included in the analysis. Both groups were found to be homogeneous with respect to age, weight, and clinical parameters. Significant differences were observed in anxiety scores ( $P = 0.026$ ), fatigue ( $P = 0.039$ ), nausea/vomiting ( $P = 0.009$ ), dyspnea ( $P = 0.011$ ), financial difficulties ( $P = 0.006$ ), and global health status in between the two groups ( $P = 0.039$ ) favoring intervention arm of nada yoga music without instructions (Group A). However, no significant changes were observed in physical functioning ( $P = 0.390$ ), role functioning ( $P = 0.453$ ), emotional functioning ( $P = 0.192$ ), cognitive functioning ( $P = 0.190$ ), and social functioning ( $P = 0.282$ ). **Conclusion:** The 12-week nada yoga music therapy intervention offers a cost-effective approach to reducing anxiety and improving the QoL for ovarian cancer patients. This study highlights the result that Nada yoga simple music is more effective in ovarian cancer patients than the nada yoga music with verbal instruction of meditation. This study showed the potential of nada yoga music therapy as a valuable addition to comprehensive cancer care, emphasizing its positive impact on emotional well-being and symptom management.

**Keywords:** Anxiety, fatigue, music therapy, nada yoga, nausea, ovarian cancer, quality of life

## Introduction

According to the International Agency for Research on Cancer WHO, ovarian cancer accounts for 6.2% of new cancer cases annually, with 36,170 new cases reported each year, resulting in 24,015 deaths.<sup>[1]</sup> Family history, advanced age, increased estrogen exposure (early and late menopause), hormone replacement therapy, etc., are major risk factors for ovarian cancer.<sup>[2]</sup> Cancer treatment necessitates a multidisciplinary approach. Depending on the stage and clinical situation, such patients are managed with surgery, chemotherapy, targeted therapy, and optimal supportive

care. Cytotoxic chemotherapy used to treat ovarian cancer has toxicities.

Chemotherapy can affect actively dividing cells in the bone marrow, hair follicles, oral mucosa, digestive tract, reproductive system, and cancer cells.<sup>[2,3]</sup> In addition, manifestable symptoms include neuropathy, ototoxicity, predisposition to infections, and declining quality of life (QoL).<sup>[3]</sup> Nausea, vomiting, diarrhea, hair loss, anorexia, mucositis, anemia, thrombocytopenia, neuropathy, weakness, anxiety, depression, fatigue, and generally lower QoL are some common adverse effects.<sup>[4]</sup> Cancers

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primarily associated with affluent economies have now become a significant global concern. Receiving a cancer diagnosis often triggers emotional distress, leading to feelings of sadness, apprehension, and anxiety.<sup>[5]</sup>

Numerous alternative medicines have emerged and undergone examination for managing chemotherapy's side effects. Integrating these approaches with conventional therapies have been shown to enhance the well-being of cancer patients, despite their inability to serve as stand-alone treatments for cancer itself.<sup>[6]</sup> Research has indicated that massage therapy<sup>[7]</sup> and acupuncture<sup>[8,9]</sup> offer benefits to cancer patients, along with other treatments. In addition, complementary techniques such as herbal treatments, dietary adjustments, nutrition, and faith healing are commonly utilized as supplementary approaches in cancer care.<sup>[10]</sup>

Numerous studies indicate that using music and meditation as complementary therapies can significantly improve the QoL overall, as well as reduce anxiety and depression in patient on chemotherapy. The nonpharmacological interventions like music therapy provide a simple and cost-effective approach, rendering it a viable and pragmatic option for addressing patients' anxiety and depression. Consequently, music therapy serves as a valuable augmentation to established treatment modalities.<sup>[11]</sup> Nada yoga is an ancient alternative therapy that emphasizes the use of sound and vibration to reach a state of deep meditation.<sup>[12]</sup> that emphasizes the use of sound and vibration to reach a state of deep meditation. Nada yoga presents a distinct advantage by offering a treatment option devoid of economic burden or adverse effects. Its relaxation benefits are anticipated to mitigate illness severity and anxiety, ultimately enhancing the QoL for patients. Consequently, our study objective is to investigate the potential of nada yoga as an alternative therapeutic approach for managing anxiety and improving the QoL in ovarian cancer patients undergoing chemotherapy.

## Materials and Methods

### Study design

This study was an open-label, randomized controlled trial with parallel group design. Figure 1 shows the consort flowchart for this study.

### Inclusion and exclusion criteria

Participants were considered eligible for the study if they met with these inclusion criteria – (a) Above 18 years of age, (b) Newly diagnosed, treatment naive, ovarian cancer patients of all stages, eligible for first-line chemotherapy, and (c) willing to participate in this study. Participants were excluded if they (a) had documented psychiatric illness, brain or spinal cord metastasis or (b) having pre exposure/practice of nada yoga.

### Sample size

Utilizing the reference,<sup>[13]</sup> the effect size for the Hamilton Anxiety Rating Scale was determined to be 0.99. Employing the G\*Power 3.1 software, an initial sample size calculation yielded 46 participants. Factoring in an estimated attrition rate of 20%,<sup>[14]</sup> the adjusted sample size was computed as 57.5. Rounding up, the final sample size for the study was determined to be 58 participants, with 29 individuals allocated to each arm of the study. To ensure unbiased participant allocation, a computer-generated random number table was employed. Allocation concealment was upheld through the utilization of sequentially numbered, opaque, and sealed envelopes, which was done by a third-party individual who possessed no clinical involvement. The study was approved by the Institutional Ethics Committee, All India Institute of Medical Sciences Rishikesh; Ref: AIIMS/IEC/20/746.

### Intervention

Nada of “Pahadi raga,” (instrumental) played by Sri Hari Prasad Chaurasiya is used as an intervention of nada yoga. It has been continuously played in Shantikunj, Haridwar for the evening Nada Yoga Sadhana since 1989. Raga Pahadi is an evening raga, so all participated patient listened this provided Nada yoga every day for 15 min in evening time (6 pm–9 pm) up to 12 weeks through the Android app (developed for this study). Participants from Group A listened this nada yoga music and participants from Group B listened this same nada yoga music with recorded verbal instructions of meditation on that music. In Group A no verbal instructions were added with nada yoga music. However, in Group B, verbal instructions were added during the nada yoga music so that patients remain awake during the intervention. Group A (control arm): Participants, in this group, listened to nada yoga music without any additional instructions. Group B (intervention arm): Participants, in this group, listened to the same nada yoga music with additional verbal instructions for meditation.

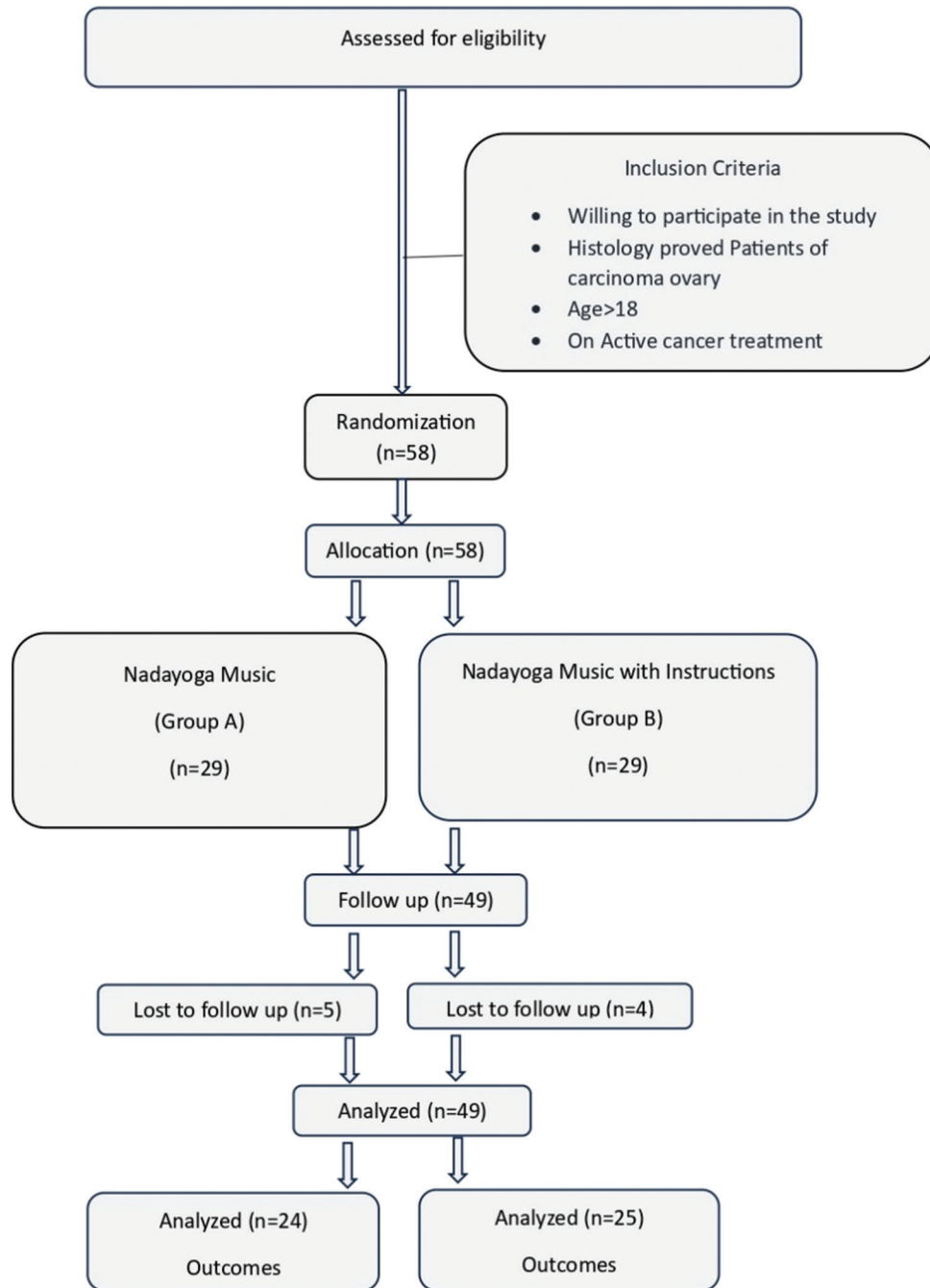
Procedure: For practicing nada yoga, one has to sit with closed eyes in an isolated place with neck and back straight, focusing on the music played.<sup>[12]</sup>

### Study outcome

The primary outcome of the study was to see any change in anxiety scores after 12 weeks of intervention of nada yoga and the secondary outcome of this study was to see any change in QoL scores after 12 weeks of intervention of nada yoga among ovarian cancer patients.

### Data collection

Following approval from the institutional ethical committee and registration in the Clinical Trial Registry – India, the study was carried out within the oncology outpatient department at AIIMS Rishikesh, Uttarakhand, India from



**Figure 1: Consort flow chart**

January 1, 2021 to July 31, 2022. Informed consent was obtained from each participant, satisfying the inclusion criteria. Participants were thoroughly briefed about all pertinent details related to the study. After that, they were randomly assigned to one of two groups (Group A –nada yoga music and Group B same nada yoga music with verbal instructions of meditation on music) Figure 1.

Android App delivered the music for 15 min daily, starting after the first chemotherapy till 12 weeks. This app was specially developed in collaboration with the faculty of computer science at the Indian Institute of

Technology Jodhpur, Investigators received information from the Android app regarding whether the patient listens to nada yoga daily. Data were collected at baseline and after 12 weeks of nada yoga intervention using the Hamilton Anxiety Rating Scale (HAM-A) and the European Organization for Research and Treatment of Cancer (EORTC) QLQ-C30 questionnaire. HAM-A<sup>[15]</sup> is one of the earliest evaluation tools created by Max R Hamilton to assess the severity of anxiety symptoms. The 14-item scale assesses both physical and psychological anxiety. It is in public domain.

EORTC QLQ-C30 was developed by the EORTC<sup>[16]</sup> having 30-item to assess the different aspects of QoL. It is designed to assess the QoL of cancer patients.

### Statistical analysis methods

Data analysis employed SPSS (Inc, Chicago, IL, USA, version 23.0 for Windows) and Microsoft Excel 2010. Mean  $\pm$  standard deviation depicted quantitative data, whereas proportions described qualitative variables. The normality of quantitative data was assessed using the Kolmogorov–Smirnov tests. Independent *t*-tests compared quantitative data between groups.  $P \leq 0.05$  denoted statistical significance.

### Results

Fifty-eight patients were initially eligible for the study after a rigorous screening process. These participants were equally randomized into two groups. During the study, five participants from the nada yoga music group and four from the nada yoga music with instruction group were lost to follow-up, resulting in 24 participants in the former and 25 in the latter group [Figure 1]. Participant's other details are mentioned in table 2.

### Demographic characteristics of participants

A total of 58 participants were included in the protocol analysis. However, after the loss to follow-up of 9 participants, 49 were included in the analysis. Both groups exhibited homogeneity in terms of age, weight, and clinical parameters [Table 1]. The mean weights of participants in Groups A and B were  $55.55 \pm 13.15$  (Kg) and  $53.35 \pm 12.18$  (Kg), respectively, showing no significant difference. Similarly, the mean heights of participants in Groups A and B were  $154.48 \pm 5.47$  (cm) and  $153.86 \pm 7.27$  (cm), respectively, showing no significant difference. The ages of menarche, menopause, marriage, and first childbirth were also quite similar between the two groups.

Figure 2 illustrates the distribution of cancer stages among participants in both groups. In Group A, the majority of

participants were classified as Stage III-A (11 participants), whereas in Group B, most fell into Stage II-C (16 participants) [Figure 2].

### Postintervention comparison statistics for anxiety and health-related quality of life

An independent *t*-test was conducted to assess the significant difference in anxiety and health-related QoL between both groups (*P* value considered significant if  $<0.05$ ).

Tables 3–5 depict the results, there was a significant difference in anxiety levels between both groups ( $P = 0.026$ ). A significant difference was found in the global health status of both groups ( $P = 0.039$ ). Thus, results reject the null hypothesis ( $H_0$ : No significant difference in anxiety levels and global health status between both groups will be found after intervention). Physical functioning, role functioning, emotional functioning, cognitive functioning, and social functioning remained unchanged with no significant differences observed.

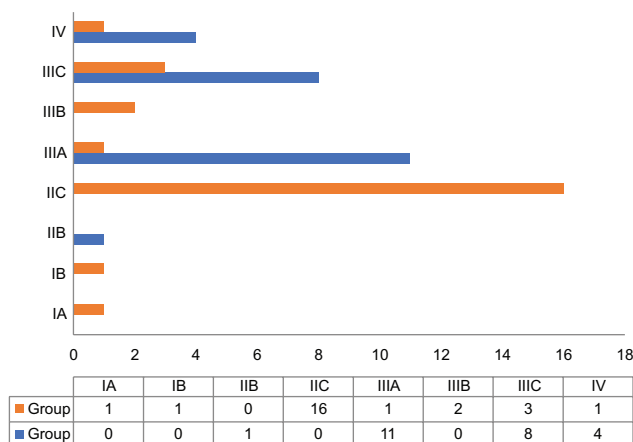
Tables 3–5 depict substantial variations in both groups for fatigue ( $P = 0.039$ ), nausea/vomiting ( $P = 0.009$ ), dyspnea ( $P = 0.011$ ), and financial difficulties ( $P = 0.006$ ).

However, there was no significant difference between the two groups in terms of pain ( $P = 0.534$ ), insomnia ( $P = 0.309$ ), constipation ( $P = 0.320$ ), appetite loss ( $P = 0.270$ ), and diarrhea ( $P = 0.070$ ) as shown in Table 5.

**Table 1: Participant's demographic characteristics**

Group	n	Mean $\pm$ SD
Age (years)		
A	24	50.5000 $\pm$ 11.76953
B	25	48.8400 $\pm$ 9.76251
Weight (kg)		
A	24	55.5500 $\pm$ 13.14978
B	25	53.3586 $\pm$ 12.18376
Height (cm)		
A	24	154.482 $\pm$ 5.47804
B	25	153.862 $\pm$ 7.27139
BMI (kg/m <sup>2</sup> )		
A	24	22.9680 $\pm$ 5.27783
B	25	22.3383 $\pm$ 5.39073
Menarche (years)		
A	24	14.4643 $\pm$ 1.87542
B	25	14.3103 $\pm$ 1.31213
Menopause (years)		
A	24	46.1000 $\pm$ 6.61657
B	25	40.4138 $\pm$ 7.30920
Marriage (years)		
A	24	19.1429 $\pm$ 3.46105
B	25	18.7586 $\pm$ 3.30211
First childbirth (years)		
A	24	21.6500 $\pm$ 2.75824
B	25	21.1034 $\pm$ 3.33107

SD: Standard deviation, BMI: Body mass index



**Figure 2: Stages of cancer**



**Table 2: Participant's characteristics**

	Group	
	A	B
Habitat		
Urban	13	15
Rural	11	10
Comorbidities		
No	18	18
T2DM	0	0
HTN	6	2
CAD	0	0
More than one	0	4
Misc/other	0	1
Breastfeeding		
Yes	23	24
No	1	1
Oral contraceptive pills		
Yes	2	6
No	22	19
Barrier method		
Yes	6	8
No	18	17
IUD		
Yes	5	6
No	19	19
Permanent method (sterilization)		
Yes	8	6
No	16	19
Family history of cancer		
Yes	2	2
No	22	23
Smoking/tobacco		
Yes	2	5
No	22	20
Diet		
Vegetarian	18	13
Mix	6	12
Education		
3 <sup>rd</sup>	9	13
5 <sup>th</sup>	4	0
8 <sup>th</sup>	4	1
10 <sup>th</sup>	3	2
12 <sup>th</sup>	2	4
Graduation/postgraduation	2	5
PhD/professional	0	0

T2DM: Type 2 diabetes mellitus, CAD: Coronary artery diseases, HTN: Hypertension, IUD: Intrauterine devices

## Discussion

The study revealed a notable disparity in anxiety levels between the two groups. When analyzing the shift from baseline to postintervention, it became apparent that Group A exhibited a significantly higher reduction in mean anxiety scores as compared to Group B. In Group B anxiety scores were slightly reduced additionally, a significant improvement in overall global health status was observed

in Group A, postintervention, accompanied by noteworthy enhancements in various aspects of functional well-being. Specifically, there were significant improvements in fatigue, nausea/vomiting, dyspnea, and financial difficulties within both groups. However, no significant differences were noted between the two groups concerning pain, insomnia, constipation, appetite loss, and diarrhea. Thus, this study reveals that nada yoga music (without verbal instruction of meditation) is more effective than nada yoga music with verbal instruction on anxiety and QoL in ovarian cancer patients.

Music induces relaxation by alleviating anxiety, potentially leading to improved sleep quality. Neurobiological investigations have substantiated the calming impact of music, demonstrating its ability to normalize frontal electroencephalographic imbalances and reduce serum cortisol levels associated with depression.<sup>[17,18]</sup>

Exploring the merits of Indian classical music as a complementary approach to antidepressant therapy, one study by Deshmukh *et al.*, delved into the therapeutic attributes of a specific raga and ancient texts. The study also advocates the utilization of Indian classical music to augment sleep quality, alongside Western classical music. Notably, the researcher observed music's effects akin to those of 10 mg of chlordiazepoxide or 7 mg of diazepam.<sup>[19]</sup>

In a separate earlier study conducted by Harikumar *et al.* in India, it was reported that endoscopic procedures benefitted from the soothing influence of Indian classical music. Distinguishing it from Western classical music, characterized by polyphony and harmonic foundations, Indian classical music is monophonic with a melody base. This distinction suggests that the psychological effects of music could be attributed to individual sounds played with specific rhythms and pitches.<sup>[20]</sup> Anxiety and despair are reported by 50%–85% of cancer patients receiving late-stage treatment.<sup>[21]</sup> Anxiety and distress significantly hinder all aspects of cancer, including its progression, the efficacy of prescribed treatments, and the QoL experienced by the patient.<sup>[22]</sup> Music therapy is a term employed by both medical professionals and musicians for the use of music to facilitate healing and improve the QoL. When integrated with conventional cancer treatments, music therapy has potential to provide numerous advantages.<sup>[23]</sup> Studies suggest music therapy as one of the most popular and innovative approaches for addressing the psychosocial effects of cancer.<sup>[24]</sup>

A systematic review<sup>[25]</sup> found that music therapies may positively impact anxiety, despair, hope, pain, and exhaustion in individuals with cancer consistently supports the findings of our study. The results point to a significant impact of music interventions on adult participants' QoL. Music therapy interventions, when administered by certified music therapists, consistently produced positive outcomes across studies, whereas music medicine therapies did not yield the same results. It is important to note that

**Table 3: Postintervention comparison statistics for anxiety and Health-related Quality of Life Scale**

Groups	n	Baseline, mean±SD	Postintervention, mean±SD
HAM-A			
A	24	11.6667±4.17723	6.7917±2.75016
B	25	9.2800±3.04850	9.3200±4.67903
GHS			
A	24	60.0694±12.52514	77.7778±10.61703
B	25	65.3333±9.52579	70.0000±14.63285
Functional Scale			
PF			
A	24	74.1667±17.94382	79.7222±13.96741
B	25	79.7333±10.08850	76.2667±13.88844
RF			
A	24	75.6944±17.01035	85.4167±14.99799
B	25	89.3333±14.33721	82.0000±16.61102
EF			
A	24	74.6528±16.93251	92.3611±7.73843
B	25	77.6667±13.76052	88.0000±14.24813
CF			
A	24	90.9722±10.96676	96.5278±6.91419
B	25	96.6667±6.80414	93.3333±9.62250
SF			
A	24	90.9722±13.88285	90.9722±13.88285
B	25	93.3333±11.78511	94.6667±9.27961
Symptom Scale			
Fatigue			
A	24	36.1111±19.45307	28.2407±10.85659
B	25	22.6667±10.86770	37.3333±18.11032
Nausea/vomiting			
A	24	16.6667±13.90096	9.7222±16.96591
B	25	18.6667±16.88743	26.6667±25.45875
Pain			
A	24	16.6667±24.07717	16.6667±15.54175
B	25	10.6667±15.86984	19.3333±14.17483
Dyspnea			
A	24	18.7500±21.59828	1.3889±6.80414
B	25	14.0000±15.72330	10.6667±15.86984
Insomnia			
A	24	48.6111±19.60767	6.9444±16.96591
B	25	45.3333±18.95414	13.3333±25.45875
Appetite loss			
A	24	22.2222±25.37957	22.2222±21.23407
B	25	14.6667±23.72684	29.3333±27.75555
Constipation			
A	24	38.8889±27.21655	13.8889±21.79542
B	25	37.3333±30.91206	8.0000±14.52966
Diarrhea			
A	24	1.3889±6.80414	8.3333±17.72032
B	25	2.6667±9.22958	20.0000±25.45875
FD			
A	24	11.1111±18.82199	9.7222±15.47685
B	25	25.3333±22.11083	25.3333±22.11083

HAM-A: Hamilton Anxiety Rating Scale, SD: Standard deviation, GHS: Global health status, PF: Physical functioning, RF: Role functioning, EF: Emotional functioning, CF: Cognitive functioning, SF: Social functioning, FD: Financial difficulties

**Table 4: Postintervention group difference statistics for anxiety and health related quality of life (Global Health Status and Functioning Scale)**

	95% CI of the difference		MD	Effect size	P
	Lower	Upper			
HAM-A	-4.746	-0.310	-2.528	1.102	0.026
	-4.735	-0.321	-2.528	1.091	0.026
GHS	0.40422	15.15133	7.77778	3.66526	0.039
	0.43757	15.11798	7.77778	3.64164	0.038
PF	-4.55120	11.46231	3.45556	3.98001	0.390
	-4.55262	11.46373	3.45556	3.98048	0.390
RF	-5.69106	12.52439	3.41667	4.52728	0.454
	-5.67263	12.50596	3.41667	4.51769	0.453
EF	-2.26821	10.99044	4.36111	3.29532	0.192
	-2.23851	10.96073	4.36111	3.25814	0.189
CF	-1.63870	8.02759	3.19444	2.40247	0.190
	-1.61658	8.00547	3.19444	2.38655	0.188
SF	-10.45507	3.06618	-3.69444	3.36058	0.277
	-10.54120	3.15232	-3.69444	3.38748	0.282

Independent *t*-test, *P* value considered significant as <0.05.

CI: Confidence interval, MD: Mean difference, HAM-A: Hamilton Anxiety Rating Scale, GHS: Global health status, PF: Physical functioning, EF: Emotional functioning, RF: Role functioning, CF: Cognitive functioning, SF: Social functioning

these findings should be interpreted with caution due to the majority of trials having poor or very low confidence in evidence and a significant risk of bias.<sup>[25]</sup>

Study showed that fatigue is reduced after music intervention.<sup>[26]</sup> Music therapy was found to have a positive effect on decreasing anxiety among breast cancer patients.<sup>[27]</sup> This has the same outcome as what our research on patients with ovarian cancer revealed.

Research findings showed that cancer patients and cardiovascular patients experienced considerably lower levels of depressive symptoms, anxiety, stress, and overall psychological discomfort after having music intervention. The findings unmistakably demonstrated that music significantly reduces the psychological anguish of cancer and cardiovascular patients. Cancer patients having autologous stem cell transplantation, a process known to cause severe psychological discomfort, were reported to experience less mood disturbance after receiving music therapy. When breast cancer patients get chemotherapy and radiation treatment, music reduces their pain and anxiety and enhances their QoL.<sup>[28]</sup>

The available research indicates that music-based therapies may benefit cancer patients' QoL, pain, anxiety, and mood disturbance. The potential processes by which music influences these outcomes may be better understood thanks to developments in neurobiology.<sup>[29]</sup>

In conclusion, nada yoga calms patients, enhances the QoL, lessens patient anxiety, and lessens the intensity of sickness. It has no negative impacts. The 12 weeks of music therapy

**Table 5: Postintervention group difference statistics for Health-Related Quality of Life Scale (Symptom Scale)**

Symptom Scale	95% CI of the difference		MD	Effect size	P
	Lower	Upper			
Fatigue	-17.719	-0.46599	-9.092	4.28813	0.039
	-17.677	-0.50760	-9.092	4.24622	0.038
Nausea/vomiting	-29.432	-4.45663	-16.944	6.20747	0.009
	-29.371	-4.51709	-16.944	6.15787	0.009
Pain	-11.209	5.87608	-2.666	4.24645	0.533
	-11.229	5.89646	-2.666	4.25458	0.534
Dyspnea	-16.348	-2.20716	-9.277	3.51468	0.011
	-16.327	-2.22760	-9.277	3.46455	0.011
Insomnia	-18.876	6.09892	-6.388	6.20747	0.309
	-18.816	6.03847	-6.388	6.15787	0.305
Appetite loss	-21.356	7.13473	-7.111	7.08135	0.320
	-21.297	7.07561	-7.111	7.04285	0.318
Constipation	-4.715	16.49375	5.888	5.27148	0.270
	-4.852	16.62992	5.888	5.31392	0.274
Diarrhea	-24.322	0.98947	-11.666	6.29114	0.070
	-24.263	0.92975	-11.666	6.24577	0.069
Financial difficulties	-26.622	-4.59960	-15.611	5.47362	0.006
	-26.570	-4.65133	-15.611	5.43471	0.006

Independent *t*-test, *P* value considered significant as <0.05.

CI: Confidence interval, MD: Mean difference

with pharmacotherapy have considerably lessened anxiety and distress. The current study's findings can be applied to ovarian cancer patients to reduce their anxiety and side effects from chemotherapy.

Nada yoga therapy may reduce anxiety and enhance QoL through several mechanisms. It likely impacts neurobiological processes by normalizing brain activity and lowering cortisol levels, thus promoting relaxation. Psychologically, the music can evoke positive emotions and provide distraction from pain, whereas the meditative aspect helps increase mindfulness and calm. Physiologically, the therapy may improve heart and respiratory rates, contributing to overall relaxation and reduced side effects of chemotherapy, such as nausea and dyspnea. In addition, improved sleep quality resulting from reduced anxiety further enhances overall well-being. This intervention is cost-effective because it utilizes easily accessible resources and does not require expensive equipment or materials. Nada yoga music and the verbal instructions for meditation were delivered through a custom android application, which is a one-time development cost and was provided free of charge to the patients. In addition, there are no ongoing costs associated with the intervention, as patients can use their own devices to access the therapy. This makes it an affordable option compared to other therapeutic interventions that might involve regular sessions with a therapist or expensive medication. Potential confounders include variability in participants' engagement with music therapy, concurrent use of other therapies, and individual psychological factors such as resilience and social support. Inherent differences in chemotherapy tolerance,

such as personal responses to treatment, may also impact outcomes. Controlling for these variables in future studies could yield more accurate results.

### Strength and limitations

This study's strengths lie in its robust randomized controlled trial design, which minimizes bias. It employs established measurement tools like the Hamilton Anxiety Rating Scale and EORTC QLQ-C30 for reliable results. A custom Android app ensures consistent music delivery, and baseline homogeneity strengthens internal validity. Nada yoga has no economic burden and adverse effects. This intervention can be assessed at home, cost-free and effective, making it a better option for improving anxiety and QoL among cancer patients.

This study was conducted on ovarian cancer patients only thus limiting generalizability on all cancer patients. Both the groups in this study went under nada yoga intervention (one without instructions and one with instructions), but there was no control group having no nada yoga exposure. The short 12-week intervention period provides only short-term insights. To support the findings, additional research is needed to examine the effects of nada yoga music on a bigger sample size of all cancer patients over a longer period.

### Conclusion

The present study highlights the significant reduction in anxiety symptoms achieved through a 12-week nada yoga music therapy intervention in ovarian cancer patients. This study highlights that in ovarian cancer patients's anxiety and QoL, nada yoga music without verbal instructions is more effective than the nada yoga music with verbal instructions of meditation on music. This cost-effective and straightforward approach offers a practical means of alleviating stress and suffering in cancer patients. Integrating music therapy into standard cancer care protocols is advisable, making it a valuable complementary technique. Music therapy not only holds promise for improving the health and QoL of cancer patients but also for addressing symptoms in various chronic conditions, such as depression. Nevertheless, further efforts are needed to establish and refine standardized procedures and assessment criteria for music-based interventions in oncology treatment.

Three key takeaways from the study:

1. Nada yoga music therapy reduces anxiety: The study demonstrates that a 12-week nada yoga music therapy intervention (Group A) significantly reduces anxiety levels in ovarian cancer patients undergoing chemotherapy. Thus results emphasize on the potential of this therapy to effectively manage anxiety during cancer treatment
2. Improved QoL: Nada yoga music therapy can positively impact the overall QoL for ovarian cancer patients. However, specific aspects of functioning (physical,

role, emotional, cognitive, and social) did not show significant changes, highlighting areas for further exploration.

Cost-effective complementary therapy: Nada yoga music therapy is highlighted as a cost-effective complementary approach for cancer care. It offers a simple and affordable means to reduce anxiety and improve the well-being of ovarian cancer patients. The study underscores the value of integrating such nonpharmacological interventions into comprehensive cancer treatment plans.

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### Conflicts of interest

There are no conflicts of interest.

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