

Effect of An Integrative Raga-Based Music Module on Chemotherapy-Induced Side Effects and Quality Of Life In Breast Cancer Patients Receiving Anthracycline Or Taxane Chemotherapy: A Randomised Controlled Study

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Abstract

Background: Anthracycline- and taxane-based chemotherapy for breast cancer causes haematological, gastrointestinal, and psychological adverse effects that impair quality of life (QoL).

Objective: To evaluate the effect of a Nine-Raga integrative music module on chemotherapy-induced side effects and QoL in breast cancer patients.

Methods: In this randomised controlled study, 120 women aged 35–70 years were allocated, 30 per group, to Group A1 (Adriamycin, trial), A2 (Adriamycin, control), B1 (Paclitaxel, trial) or B2 (Paclitaxel, control). Trial groups listened to the module (nine Ragas with meditation, Chakra Dhyana, Mudra therapy and Sanskrit affirmations) twice daily for seven days per cycle; controls received standard supportive care. Haemoglobin, total leucocyte count (TLC), platelet count, CTCAE v5.0 symptom grades, Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and WHOQOL-BREF were recorded at baseline, intermediate and final visits.

Results: All 120 patients completed the study. At the final visit, trial groups had lower depression ($p < 0.0001$ in both cohorts) and anxiety scores (A1 vs A2, $p < 0.0001$; B1 vs B2, $p = 0.0006$) and higher QoL scores ($p < 0.0001$ in both cohorts) than controls. Nausea grade was lower in A1 than A2 ($p = 0.0022$), and fatigue grade was lower in B1 than B2 ($p = 0.0087$). Haemoglobin declined significantly in A2 ($p = 0.0082$) but not in A1 ($p = 0.2046$); the A1–A2 difference was significant at baseline ($p = 0.0235$) and the intermediate visit ($p = 0.0320$) but not the final visit ($p = 0.0575$), and B1 and B2 did not differ. TLC was lower in A1 than A2 at the intermediate ($p = 0.037$) and final ($p = 0.043$) visits; B1 and B2 did not differ. Platelet counts did not differ between groups.

Conclusion: The Raga module was associated with lower depression and anxiety scores, better QoL and less nausea (Adriamycin cohort) than standard care alone, with no consistent haematological advantage. Music therapy intervention was found effective for reducing anxiety and depression and improving quality of life in breast cancer patients during chemotherapy.

Keywords: breast cancer; chemotherapy-induced side effects; music therapy; Raga chikitsa; integrative oncology; Ayurveda; anxiety; depression; quality of life.

1. Introduction

Breast cancer is the most frequently diagnosed cancer in women worldwide, accounting for nearly 12% of all new cancer cases [1]. Anthracyclines such as doxorubicin (Adriamycin) and taxanes such as paclitaxel form the backbone of neoadjuvant, adjuvant, and metastatic treatment. Because these drugs act on all rapidly dividing cells, they cause myelosuppression, gastrointestinal and mucocutaneous toxicity, peripheral neuropathy, alopecia and psychological distress, which together reduce QoL [2]. Anaemia and neutropenia cause fatigue and infection risk and may force dose reduction [3], while elevated anxiety and depression affect treatment adherence and symptom perception [2]. Antiemetic prophylaxis has reduced some toxicities, but breakthrough and anticipatory nausea persist [4].

Integrative oncology guidelines now recommend mind–body approaches for pain, anxiety and depression, and cite music-based interventions as a low-risk adjunct [5,6]. Music interventions are inexpensive, non-invasive, free of pharmacological activity, and can be self-administered. A Cochrane review found that music reduces anxiety and moderately improves mood and QoL in cancer patients [7]. In breast cancer chemotherapy, a pre-infusion music programme improved functional QoL and lowered depression and anxiety scores [8], and a music-plus-relaxation pilot trial reduced anxiety, depression and stress [9]. These trials used mainly Western music and psychological outcomes; objective haematological parameters were rarely reported.

Hindustani classical music occupies one of the key positions amongst the range of interventions used nowadays within the framework of modern integrative medicine. Ragas are structured melodic forms whose intervals,

tempo and rhythm produce predictable emotional responses, including reduced arousal [10]. Raga influences Tridosha (biological regulatory systems of Vata, Pitta, and Kapha) and Triguna (the mind qualities of Sattva, Rajas, and Tamas), where the use of calming Ragas traditionally helps to calm Vata and increase Sattva, which stands for the mind quality. In Ayurveda, calming Ragas are used to pacify Vata and Pitta and to increase Sattva [11,12]. Music therapy has been mentioned as one of the supportive measures to pacify the Pitta dosha in the ancient classical Ayurveda text Charak Samhita Viman Sthana. Evidence for Raga-based therapy in oncology is limited to small case series, and no controlled study has tested it across anthracycline and taxane regimens.

Although there is quite well-established literature available on the use of music therapy for breast cancer patients through the application of Western instruments, assessment based on Indian classical ragas with a specific design is unexplored. Prior music-intervention trials in oncology have concentrated almost exclusively on psychological and quality-of-life outcomes, with objective haematological parameters rarely included as assessment parameters; the possibility that reduced treatment-related physiological stress could translate into attenuated myelosuppression has therefore remained largely untested. Indian classical music-based intervention simultaneously across two pharmacologically distinct chemotherapy backbones (anthracycline and taxane) within the same trial design has not been stratified, although these regimens differ substantially in their toxicity profile, cycle schedule, and expected symptom trajectory, which may plausibly modify the effect of a supportive intervention.

The present research was formulated to evaluate the effect of a Nine-Raga integrative music module, compared with standard supportive care alone, on haematological parameters, CTCAE-graded symptoms, depression, anxiety and QoL in breast cancer patients receiving Adriamycin or Paclitaxel. Each regimen was analysed separately.

1.2. Research Objectives

The primary objective of this study was to evaluate the effect of a Nine -Raga integrative music module on chemotherapy-induced side effects and quality of life in breast cancer patients receiving Adriamycin or Paclitaxel chemotherapy, compared with standard supportive care alone. The specific objectives were:

- (1) To compare the trajectory of objective haematological parameters-haemoglobin, total leucocyte count, and platelet count-between music-module (trial) and control groups within each chemotherapy backbone across baseline, intermediate, and final visits.
- (2) To compare CTCAE-graded subjective symptoms, including nausea, vomiting, anorexia, peripheral numbness/tingling, oral mucositis, dizziness, alopecia, diarrhoea, constipation, fatigue, and pain, between trial and control groups.
- (3) To compare psychological status, measured using the Beck Depression Inventory and Beck Anxiety Inventory, between trial and control groups.
- (4) To compare quality of life (QOL), measured using the WHOQOL-BREF, between trial and control groups.

1.3. Novel Contributions

This study contributes to the supportive oncology literature in several respects. It is among the first controlled trials to evaluate a fully structured, multi-Raga (nine-Raga) integrative music module-combining receptive listening with meditation, Chakra Dhyana, Mudra practice, and Sanskrit affirmations- as guided relaxation, rather than a single musical stimulus, reflecting a more complete operationalisation of the traditional Raga chikitsa approach than has previously been tested. It simultaneously captures objective haematological indices alongside CTCAE-graded symptom burden and validated psychological and quality-of-life instruments within a single design, allowing triangulation between biomedical and patient-reported outcomes.

2. Materials and Methods

2.1 Study design and participants

This prospective, randomised, parallel-group, controlled study was conducted at Bharati Vidyapeeth (Deemed to be University) College of Ayurved, Pune, in collaboration with Bharati Hospital and Research Centre, Dhankawadi, Pune. The institutional ethics committee approved the protocol, written informed consent was taken from all participants, and the study was registered with the Clinical Trials Registry-India [CTRI No. **CTRI/2022/12/048523**]

Pre diagnosed breast cancer women aged 35–70 years, scheduled for adjuvant or neoadjuvant Adriamycin or Paclitaxel, and fulfilling the inclusion criteria were included in the study. This age range covers most breast cancer cases while avoiding the hearing loss and multimorbidity of extreme age, which hinder music delivery. Patients receiving other chemotherapeutic or biological agents (e.g., trastuzumab) whose toxicity could

confound interpretation, and those unable to follow the protocol, were excluded. Of 205 patients assessed, 81 were excluded and 124 were randomised (Figure 1).

2.2 Sample size, randomisation and allocation

Sample size was calculated with the two-proportion formula for comparing independent groups [13], assuming a side-effect prevalence of 60% under standard care and 20% with the intervention ($\alpha = 0.05$, power 80%). The minimum sample was 20 per group; 30 per group (120 in total) were enrolled to allow for attrition. Within each regimen, patients were allocated to trial or control by simple random sampling (lottery method), giving four groups of 30: A1 (Adriamycin, trial), A2 (Adriamycin, control), B1 (Paclitaxel, trial) and B2 (Paclitaxel, control).

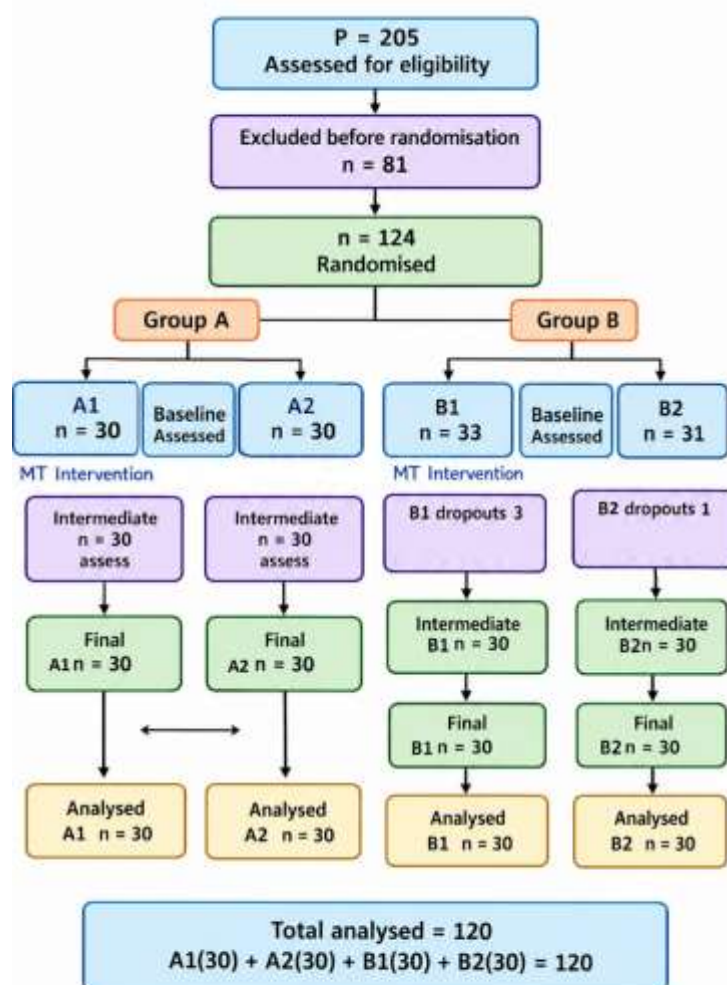


Figure 1. Participant flow through screening, randomisation, intervention, assessment and analysis (n at each stage).

2.3 Intervention and control

The module was developed by an onco-surgeon trained in Indian classical music. It comprised Nine Ragas (Bhup, Lalat, Hansadhvani, Kalawati, Shree, Shivananjani, Bhimapalasi, Jaijivanti, and Bairagi) rendered vocally and instrumentally (flute and tabla), with each session incorporating guided meditation, Chakra Dhyana, Mudra Abhyas and Sanskrit affirmations. The patients were counselled and trained to listen to respective sessions of Raga during the initial phase and at the end of chemotherapy. After an initial practice session, trial-group patients (A1, B1) listened to the module twice daily (morning and evening) for seven consecutive days in each chemotherapy cycle until the end of chemotherapy. Patients received Adriamycin three-weekly or two-weekly (four cycles) and Paclitaxel weekly (twelve weeks), so the module was given as per the cycle structure of each regimen. After the last chemotherapy cycle, trial groups received one further seven-day module, and the final assessment was done after it ended. A patient diary was reviewed weekly by the researcher. Control groups (A2, B2) received standard supportive care only, without music or an attention-control activity.

2.4 Outcome measures and assessment schedule

Patients were assessed at three visits: baseline (just before the first cycle), intermediate (during chemotherapy [after 2nd cycle in Adriamycin group and after 6th cycle in Paclitaxel group]), and final (at the end of last chemotherapy session the very next day i.e. 4th cycle of Adriamycin and 12th cycle of Paclitaxel). Objective outcomes were haemoglobin, TLC and platelet count. Symptoms (nausea, vomiting, anorexia, peripheral numbness/tingling, oral mucositis, dizziness, alopecia, diarrhoea, constipation, fatigue and pain) were graded using CTCAE v5.0 [14]. Depression and anxiety were measured with the BDI [15] and BAI [16], and QoL with the 26-item WHOQOL-BREF [17].

2.5 Statistical analysis

Continuous, approximately normally distributed variables (haemoglobin, WBC count, platelet count) were summarised as mean $\pm$ standard deviation and compared within groups across the three visits using repeated-measures ANOVA, with post-hoc pairwise comparisons (Baseline vs Intermediate, Baseline vs Final, Intermediate vs Final); between-group comparisons at each visit were performed using the unpaired t-test. Ordinal and non-normally distributed variables (CTCAE symptom grades, Beck Depression and Anxiety Inventory scores, WHOQOL-BREF scores) were summarised as median (range) and compared within groups using the Friedman test with post-hoc pairwise comparisons, and between groups at each visit using the Mann-Whitney U test. A two-tailed p-value of less than 0.05 was considered statistically significant throughout. Analysis was performed separately for the Adriamycin cohort (Groups A1 vs A2) and the Paclitaxel cohort (Groups B1 vs B2).

3. Results

3.1 Baseline characteristics

A total of 124 patients were enrolled for the study, and information was collected. Two patients from the trial group (B1), after the first chemo cycle, dropped out of the study as they were shifted for their chemotherapy to other hospitals due to personal family reasons. One patient from the trial group (B1) was scheduled for surgery after one cycle of paclitaxel. One patient from the control group failed to attend the follow-up and dropped out of the study after the first chemo cycle. A total of 120 enrolled patients (30 per group) completed baseline, intermediate, and final assessments. Therefore, the data analysis was performed on 120 patients. In all 120 patients (30 per group), baseline TLC, platelet count, BDI, and BAI did not differ between trial and control groups. Baseline differences were present for haemoglobin in the Adriamycin cohort (A1 higher than A2, $p = 0.0235$) and for QoL in the Paclitaxel cohort (B1 lower than B2, $p = 0.0067$).

3.2 Haematological parameters

Haemoglobin (Table 1). In the Adriamycin cohort, haemoglobin was higher in A1 than A2 at baseline ($p = 0.0235$) and at the intermediate visit ($p = 0.0320$), but not at the final visit ($p = 0.0575$). It declined significantly across visits in A2 ($p = 0.0082$) but not in A1 ($p = 0.2046$). In the Paclitaxel cohort, haemoglobin declined significantly in both B1 and B2 ($p < 0.0001$ each), and the groups did not differ at any visit.

Table 1. Haemoglobin across visits (n = 30 per group).

Group	Haemoglobin (g/dL), mean $\pm$ SD			Intra-group p	Inter-group p
	Baseline	Intermediate	Final		
A1 (Adriamycin, trial)	12.18 $\pm$ 1.24	11.20 $\pm$ 0.96	10.88 $\pm$ 1.08	0.2046 (ns)	Baseline 0.0235* Intermediate 0.0320* Final 0.0575 (ns)
A2 (Adriamycin, control)	11.40 $\pm$ 1.35	10.57 $\pm$ 1.26	10.30 $\pm$ 1.26	0.0082*	
B1 (Paclitaxel, trial)	10.24 $\pm$ 1.40	10.14 $\pm$ 1.13	10.52 $\pm$ 1.11	< 0.0001*	> 0.05 at all visits
B2 (Paclitaxel, control)	10.78 $\pm$ 1.22	10.06 $\pm$ 1.34	10.29 $\pm$ 1.41	< 0.0001*	

Repeated-measures ANOVA (intra-group) and unpaired t-test (inter-group, trial vs control). * $p < 0.05$; ns, not significant.

Total leucocyte count (Table 2). In the Adriamycin cohort, TLC fell significantly in both A1 ($p < 0.0001$) and A2 ($p = 0.0338$). TLC was lower in A1 than A2 at the intermediate ($p = 0.0371$) and final ($p = 0.0434$) visits. In the Paclitaxel cohort, TLC fell significantly only in B2 ($p = 0.0327$); B1 and B2 did not differ at any visit.

Table 2. Total leucocyte count across visits (n = 30 per group).

Group	TLC (cells/mm ³), mean $\pm$ SD			Intra-group p	Inter-group p
	Baseline	Intermediate	Final		
A1 (Adriamycin, trial)	7478.3 $\pm$ 2314.6	5835.4 $\pm$ 2033.0	5271.7 $\pm$ 1365.2	< 0.0001*	Intermediate 0.0371* Final 0.0434*
A2 (Adriamycin, control)	8128.6 $\pm$ 2585.9	7256.7 $\pm$ 3029.2	6543.1 $\pm$ 3083.1	0.0338*	
B1 (Paclitaxel, trial)	6505.7 $\pm$ 2267.5	5351.7 $\pm$ 1844.9	6162.7 $\pm$ 2904.5	0.0736 (ns)	Final 0.9891 (ns); > 0.05 at all visits
B2 (Paclitaxel, control)	7066.7 $\pm$ 2815.3	5607.4 $\pm$ 2430.2	6172.7 $\pm$ 2720.9	0.0327*	

Repeated-measures ANOVA (intra-group) and unpaired t-test (inter-group, trial vs control). *p < 0.05; ns, not significant.

Platelets. Platelet counts (lakh/mm³) did not change significantly within any group (e.g., A1 3.31 $\pm$ 1.29 to 3.21 $\pm$ 1.14; A2 3.02 $\pm$ 0.70 to 3.13 $\pm$ 1.98) or differ between groups at any visit (all p > 0.05).

3.3 CTCAE-graded symptoms

Final-visit CTCAE grades are shown in Table 3. Nausea was lower in A1 than A2 at the final visit (median 1 [0–2] vs 2 [1–2]; p = 0.0022) but not at the intermediate visit (p = 0.8255). Fatigue was lower in B1 than B2 at the final visit (p = 0.0087), whereas A1 and A2 did not differ (intermediate p = 0.2067; final p = 0.1304). No other symptom differed significantly between trial and control groups. Alopecia was grade 2 in all groups, and numbness/tingling occurred only in the Paclitaxel groups.

Table 3. Final-visit CTCAE grade, median (range), n = 30 per group.

No.	Symptom	A1 (trial)	A2 (control)	p (A1 vs A2)	B1 (trial)	B2 (control)	p (B1 vs B2)
1	Nausea	1 (0–2)	2 (1–2)	0.0022*	0 (0–1)	0 (0–1)	0.9938
2	Vomiting	0.5 (0–2)	1(0–2)	0.2911	0 (0–0)	0 (0–0)	NA
3	Anorexia	1 (0–2)	2 (1–2)	0.0014*	1 (0–2)	1 (0–2)	0.3132
4	Numbness/tingling	0 (0–0)	0 (0–0)	NA	1 (1–2)	1 (0–3)	0.3623
5	Oral mucositis	1 (0–2)	0 (0–1)	NA	0 (0–1)	0 (0–1)	0.1038
6	Dizziness	0 (0–0)	0 (0–1)	NA	0 (0–1)	0 (0–1)	0.1038
7	Alopecia	2 (2–2)	2 (2–2)	NA	2 (2–2)	2 (2–2)	NA
8	Diarrhoea	0 (0–2)	0 (0–2)	0.5115	0 (0–1)	0 (0–2)	0.0124*
9	Constipation	0 (0–2)	0 (0–2)	0.0058*	0 (0–2)	0 (0–2)	0.3268
10	Pain	0 (0–1)	0 (0–2)	0.7646	0 (0 - 2)	0 (0 - 2)	0.4782
11	Fatigue	1 (0 - 2)	1.5 (0 - 2)	0.1304	1 (0 - 2)	1 (0 - 2)	0.0087*

Mann–Whitney U test (trial vs control). *p < 0.05., NA-Not applicable, as symptom not found

3.4 Depression, anxiety and quality of life

Depression. Median BDI score fell from 15.5 to 10 in A1 but rose from 13.5 to 23 in A2 (final p < 0.0001), with no baseline (p = 0.1412) or intermediate (p = 0.6255) difference. In the Paclitaxel cohort, median BDI score fell from 15 to 10 in B1 and rose from 15 to 21 in B2 (final p < 0.0001) with no baseline (p = 0.3363) or intermediate (p = 0.0645) difference.

Anxiety. Median BAI score fell progressively across visits in A1 (21.5, 13, 7) and B1 (21, 15, 8), and fell less in A2 (to 14) and B2 (to 12.5). The A1–A2 difference was significant at the intermediate visit (p = 0.0326) and the final visit (p < 0.0001); the B1–B2 difference was significant at the final visit (p = 0.0006).

Quality of life. Median WHOQOL-BREF score rose from 73 to 86 in A1 but fell from 79 to 62.5 in A2 (intermediate and final $p < 0.0001$). In the Paclitaxel cohort, it rose from 71.5 to 83 in B1 and fell from 77 to 65.5 in B2 (final $p < 0.0001$).

Table 4. Depression (BDI), anxiety (BAI), and quality of life (WHOQOL-BREF) across visits, median (range), n = 30 per group.

Group	Baseline	Intermediate	Final	Inter-group p (final)
Beck Depression Inventory				
A1 (trial)	15.5 (6–43)	21 (7–37)	10 (3–26)	< 0.0001*
A2 (control)	13.5 (2–28)	22 (12–37)	23 (5–40)	
B1 (trial)	15 (10–27)	19 (10–30)	10 (4–27)	< 0.0001*
B2 (control)	15 (7–23)	22 (11–32)	21 (8–33)	
Beck Anxiety Inventory				
A1 (trial)	21.5 (8–36)	13 (7–32)	7 (2–14)	< 0.0001*
A2 (control)	21.5 (6–34)	15.5 (6–31)	14 (3–40)	
B1 (trial)	21 (6–39)	15 (9–25)	8 (2–27)	0.0006*
B2 (control)	21.5 (9–30)	16 (8–24)	12.5 (7–21)	
WHOQOL-BREF (raw score)				
A1 (trial)	73 (59–102)	75 (60–105)	86 (60–110)	< 0.0001*
A2 (control)	79 (54–105)	63.5 (46–83)	62.5 (45–102)	
B1 (trial)	71.5 (58–87)	68 (58–86)	83 (67–99)	< 0.0001*
B2 (control)	77 (65–90)	66 (53–76)	65.5 (43–79)	

Mann–Whitney U test (trial vs control). * $p < 0.05$.

4. Discussion

Psychological issues in breast cancer patients receiving chemotherapy have become a major concern. Distress, anxiety, and depressive symptoms are reported by a large proportion of patients during active treatment, often peaking around the time of diagnosis disclosure and again during periods of acute toxicity [3][5]. However, it was discovered that the relationship between physical symptom-related discomfort and psychological well-being is a two-way process: the more anxious the patient feels, the higher the level of perceived nausea and pain, which, in turn, impacts the patient's psychological state, creating an endless loop that cannot be broken by using standard treatment strategies against nausea and pain only.

The most consistent finding was lower depression and anxiety and higher QoL in both trial groups than in controls, in both chemotherapy cohorts. This agrees with a Cochrane review of music interventions in cancer [7] and with trials in breast cancer chemotherapy: Lima et al. reported better functional QoL and lower BDI-II and BAI scores after 30-minute pre-chemotherapy music sessions over three cycles [8], and Nguyen et al., in a pilot trial of 24 women with breast or gynaecological cancer, found feasibility and preliminary reductions in anxiety, depression and stress with music plus progressive muscle relaxation delivered at home for three weeks [9]. The present study was larger ($n = 120$), used a multi-element module (Ragas with meditation, Mudra and affirmations), analysed two regimens separately, and added haematological outcomes. The between-group differences here were larger than those usually reported for brief Western music interventions, which may reflect the twice-daily, repeated dosing, the multimodal content, or the psychophysiological properties attributed to the selected Ragas [10]. Depression scores rose in controls over treatment, whereas they fell in trial groups.

Among physical symptoms, only nausea (Adriamycin cohort) and fatigue (Paclitaxel cohort) differed significantly. Nausea has a conditioned, anticipatory component [4] that a calming intervention could plausibly reduce. Alopecia and taxane-related numbness reflect direct cytotoxic and neurotoxic injury [19] and were, as expected,

unaffected. The fatigue effect in only one cohort may reflect the different schedules (weekly vs three-weekly), but this is speculative.

The haematological findings do not show a consistent benefit. In the Adriamycin cohort, haemoglobin differed between groups at baseline, so the intermediate-visit difference cannot be attributed to the intervention, and the final difference was not significant. TLC was significantly lower in A1 than A2 at the intermediate and final visits, which does not support a protective effect, and no difference was seen in the Paclitaxel cohort or for platelets. Psychological stress can influence haematopoiesis through hypothalamic–pituitary–adrenal and cytokine pathways [18], and Figure 2 summarises the proposed mechanism, but any effect of the module on blood counts remains hypothetical and needs testing with pre-specified haematological endpoints.

The Ayurvedic Tridosha-Triguna framework and its physiological correlates

Ayurveda conceptualises quality of life (QOL) as dynamic equilibrium among three governing bio-regulatory principles-Vata, Pitta, and Kapha-modulated by the mental qualities of Sattva, Rajas, and Tamas. Contemporary integrative-medicine scholarship has drawn explicit parallels between this framework and psychoneuroimmunology, proposing that psychological stressors precipitate Dosha vitiation and neuroendocrine imbalance in a manner that mirrors the hypothalamic-pituitary-adrenal axis dysregulation and cytokine-mediated sickness behaviour described in the biomedical literature on cancer-related fatigue and mood disturbance. Within this correlate model, calming interventions such as meditation, controlled breath regulation, and Raga listening are understood to pacify aggravated Vata -Pitta and elevate Sattva, translating in biomedical terms into reduced sympathetic arousal and improved subjective wellbeing. While this correspondence remains a conceptual and largely qualitative bridge rather than a mechanistically proven pathway, it offers a coherent rationale for why a structured, Ayurveda-informed music module might plausibly influence both the psychological and, indirectly through reduced physiological stress load, the haematological trajectory of chemotherapy patients.

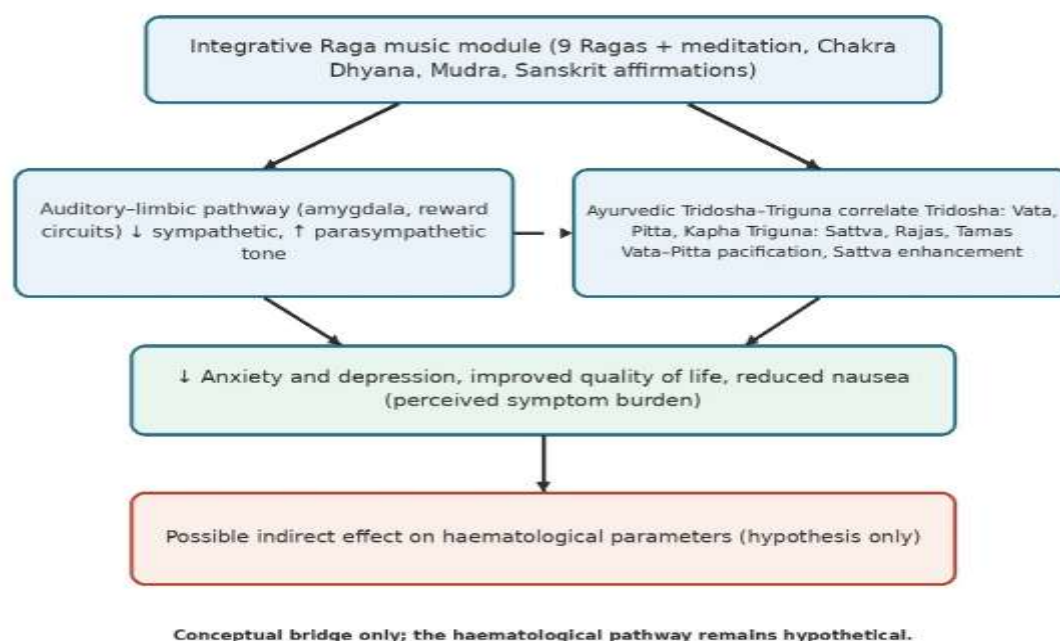


Figure 2. Proposed conceptual mechanism linking the Raga music module to the observed outcomes, bridging Ayurvedic Tridosha–Triguna concepts and biomedical pathways. The haematological pathway is hypothetical.

Differences between the anthracycline and taxane cohorts

A recurring pattern across outcome domains was a somewhat more consistent statistical benefit in the Adriamycin (three-weekly) cohort for haematological and psychological endpoints, alongside a more consistent fatigue benefit in the Paclitaxel (weekly) cohort. This divergence may reflect the different treatment rhythms: three-weekly Adriamycin cycles allow a full seven-day music module to be completed with a clearer interval before the next cycle, potentially allowing more complete physiological recovery, whereas weekly Paclitaxel dosing compresses the assessment window and may make fatigue-a cumulative, dose-dense phenomenon-more responsive to the intervention's cumulative calming effect. These regimen-specific differences highlight the importance of stratified reporting in integrative-oncology trials and suggest that module scheduling may benefit from tailoring to the specific chemotherapy cycle structure in future protocol refinements.

5. Conclusion

Raga integrative music module added to standard care was associated with lower depression and anxiety, better quality of life and less nausea in patients receiving Adriamycin or Paclitaxel, but not with a consistent haematological benefit. Randomised, multicentre, blinded studies with attention-control arms are needed before it is adopted in practice.

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Conflict of Interest

The authors declare no conflict of interest.

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Data Availability Statement

The datasets analysed are derived from the corresponding author's doctoral thesis records and are available from the corresponding author on reasonable request, subject to institutional ethics approval for secondary use.

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