

DEVELOPMENT OF INDIAN MUSIC THERAPY MODULE FOR PITTA IMBALANCE AND FEASIBILITY CHECK FOR AMLAPITTA (GERD)

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Abstract

Background: Gastroesophageal reflux disease (GERD) is a chronic gastrointestinal disorder characterized by the regurgitation of gastric contents into the esophagus. Amlapitta is correlated with GERD in Modern medicine caused due to Deranged Pitta (Metabolic Fire) leading to psychological imbalance of anger. Acharya Charaka recommends Music for healing Pitta imbalance. Scientific studies on music have revealed its efficacy in enhancing relaxation, reducing anxiety, fear, and anger facilitating self-expression. No validated Raga module (RM) based on time theory correlated to the circadian cycle of doshas is available for Pitta imbalance and Indian Ragas feasible for Amlapitta (GERD) patients has not been studied.

Objective(s): To develop an RM for Pitta imbalance and investigate its feasibility of use in Amlapitta patients as an add-on therapy.

Materials and methods: Three stages of study were, Development of RM; Validation of RM by fifteen experts having experience in Ayurveda and Music, where Ragas with a CVR score of > 0.49 were retained in the final RM; Feasibility check with 10 Amlapitta patients.

Results: Following six weeks of music sessions, all showed significant changes in Pitta imbalance and anger trait with a P value of 0.001 and significant changes in Vata (Mobility) and Kapha (Binding energy) dosha with P values 0.001 and 0.002 respectively.

Conclusion: The RM with Twenty-Four Ragas for Pitta Imbalance has been validated for counteracting trait anger associated with Pitta. A pilot study evaluated the feasibility of four of these Ragas in patients with Amlapitta.

Keywords: Raga Module (RM), Pitta imbalance, Amlapitta, Emotional Healing.

INTRODUCTION

Gastroesophageal Reflux Disease (GERD) is characterized by symptoms and complications arising from the reflux of stomach contents into the esophagus, with high prevalence rates reported even in Asian countries; for instance, a study found a prevalence of 16.2% in an urban adult population from Northern India. ^{[1][2]} Typical symptoms include heartburn and regurgitation, while atypical symptoms can involve dysphagia, oropharyngeal hoarseness, chronic cough, and nausea. ^[3]

From an Ayurvedic perspective, GERD is associated with *Agnimandya* (indigestion) and categorized under *Pitta Pradhana Vyadhi*. Amlapitta, defined as a condition where vitiated *Pitta* becomes sour (*Amla*) and burns (*Vidagdhatta*), manifests symptoms such as sour belching, heartburn, fatigue, and chest pain. ^{[4][5][6]} According to *Ayurveda*, one is in perfect health when the three physiological *Doshas* (*Vata* -air, *Pitta*-fire, and *Kapha*-Water), Digestive fire, all the body tissues and components, all the excretory functions are in perfect order with a pleasant and contented spirit, senses and mind. ^[7]

The *Pitta Dosha* is responsible for metabolism and energy, *Vata* oversees cell functions and waste elimination, and *Kapha* relates to growth and stability. ^[8] Acharya Charaka explains that diseases arise from the vitiation of physiological *Doshas* and psychological components (*Gunas*) namely *Rajas* (passion) and *Tamas* (stagnation), or from a combination of both. The interdependence of these physical and psychological aspects means that an imbalance in one can affect the others. Ayurvedic healthcare focuses on restoring equilibrium by balancing the *Doshas* and *Gunas*.^[9]

An improper diet rich in spicy, salty, and oily foods, along with lack of rest, insufficient sleep, and a stressful lifestyle, causes an increase in *Pitta Dosha*, leading to the production of *Ama* (toxins) and symptoms of

Amlapitta.^[10] Anger is identified as a primary factor in Pitta-related physical disorders.^[11] To counteract *Pitta*, *Acharya Charaka* recommends listening to soothing, pleasant music.^[12]

Indian music consists of seven technical elements: *Nada* (Sound), *Shruti* (pitch), *Svara* (tone), *Raga* (melody), *Tala* (rhythm), *Rasa* (Aesthetic mood), and *Thaat* (scale). The seven *Shuddha Svaras* (pure notes) are *sa*, *ri*, *ga*, *ma*, *pa*, *dha*, and *ni*. Each note can be either *Komal* (flat) or *Teevra* (sharp); *sa* and *pa* are steady notes, while the others can have both forms, totaling 12 notes. Effective music therapy relies on correct intonation and the proper use of these elements, with the goal of invoking *Rasa* to promote equipoise and emotional healing.^[13] The four *Rasas*—*Shringara* (Love), *Shanta* (Peace), *Veera* (Self-Assurance), and *Karuna* (Compassion)—are evoked through specific combinations of *Svaras* in a *Raga*, making them suitable for therapeutic applications aimed at positively influencing the psychological aspects of *Dosha*, as highlighted in *Ayurvedic* texts.^[14] For disturbed *Pitta Dosha*, characterized by anger, balance can be achieved through calmness and compassion by listening to *Ragas* with *ri* and *dha Komal Svaras*. This approach aligns with the principle of *Samanya Vishesha Sidhanta* (SVS), which asserts similar properties will lead to augmentation and dissimilar properties leads to the reduction of the factor.^[15]

Music aligns the mind with *Satwa Guna* (Goodness) by reducing *Rajas* and *Tamas*.^[16]

Western studies have shown that music therapy can benefit various digestive disorders, including irritable bowel syndrome and chemotherapy-induced nausea in cancer patients. It has also been found to enhance relaxation, reduce anxiety and pain in colorectal cancer patients, improve gastric myoelectrical activity, and lower hypertension.^{[17][18][19][20][21][22][23]} These findings support the positive role of music interventions for digestive disorders and hypertension.

Ancient texts suggest that aligning *Ragas* with the circadian cycle of *Doshas* can help balance physiological and psychological states.^[14] However, there is currently no structured *Raga* module based on this time theory specifically for balancing *Pitta*, which could be beneficial in healing *Amlapitta* (GERD).

METHODS

The research was conducted in three phases: (1) Phase I involved the development of *Raga* module (RM) for *Pitta* imbalance (2) in Phase II, the developed RM was validated by experts (3) in Phase III, the validated RM was tested with pilot study conducted on ten patients diagnosed with *Amla pitta* as shown in Figure 1



Figure 1 Three Stages of Research

PHASE I: DEVELOPMENT OF THE RM

In Phase I of the study, the RM was developed through a review of classical and contemporary musical texts to promote *Shanta Rasa* (Calmness). Four experts trained in *Hindustani* and *Carnatic* music and knowledgeable in *Ayurveda* conducted the literature review, examining five classical texts: *Sangeeta Ratnakara* ^[24], *Sangeeta Makaranda* ^[25], *Bharata Natya Shastra* ^[26], and contemporary works such as *Bhatkhande's Contribution to Music* ^[29] and *Raga Nidhi* (Volumes 1-4) ^[30].

Additionally, classical *Ayurvedic* texts like *Charaka Samhita* [27] and *Ashtanga Hridaya* [28], along with research articles on music therapy for digestive disorders, were reviewed using search engines such as PubMed, Google Scholar, Scopus, and ScieFinder with keywords including “Music therapy,” “*Amlapitta*,” “Digestive disorders,” “Effect of music,” and “hyperacidity.”

PHASE II: VALIDATION OF THE RM BY THE EXPERTS

The validation process involved experts with at least five years of clinical *Ayurveda* experience, active use of music therapy, and sufficient *Ayurvedic* knowledge, all trained in Indian Classical Music. Out of 25 experts approached, 18 responded, and 15 were deemed eligible, including 2 musicians. All agreed to provide feedback on the RM.

Experts received a summary of the study, *Ragas*, their timings, and associated *Rasa* for rating on a scale of 0–4 ((0: not at all useful, 1: a little, 2: moderately useful, 3: very much useful 4: extremely useful), with options for subjective feedback. Content validity was assessed using Lawshe’s Content Validity Ratio (CVR) formula: $CVR = (N_e - N/2)/N/2$, where N_e is the number of experts rating a practice as 'very much useful' or 'extremely useful' and N is the total number of experts. [31] The RM features 24 *Ragas* with *ri*, and *dha Komal Svaras* from *Bhairav*, *Marwa*, and *Purvi Thaata*. Selections were based on their correlation with *Raga* time theory and the Circadian cycle of *Doshas*, including only *Ragas* with a CVR greater than 0.49.

PHASE III: FEASIBILITY TESTING OF THE VALIDATED RM

A pilot study involving ten patients diagnosed with *Amlapitta* was conducted to evaluate the acceptance and feasibility of the validated RM. Feasibility was measured using the *Vikruti Tridosha* Diagnosis Scale (VTDS) [32], which includes 97 questions across six sections assessing physiological and psychological aspects of the *Tridoshas* (*Vata*, *Pitta*, *Kapha*) and emotional states related to trait anger. The *Kshaya* section was discarded, focusing solely on *Vridhhi*, as *Charaka* states that disease arises from *Dosha Vridhhi*, not *Kshaya* [33]. Additionally, the *Prakriti* Analysis Tool (PPAT) [34] assessed the participants' *Dosha* constitution before the intervention, with scores calculated to determine *Dosha* predominance.

PARTICIPANTS

Ten participants were recruited from *Anugraha* Medical Centre, Kerala, for this pilot study, with an average age of 38 ± 2.9 years. Over six weeks, they engaged in online supervised music sessions, conducted four times daily for 15 minutes each, led by a certified *Ayurvedic* physician with music expertise. All participants completed the intervention and post-assessment, with no dropouts.

Institutional ethical approval was granted by SVYASA University, NO: RES/IEC-SVYASA/297/2023_ERC). This study, part of MSc (Yoga) research, was registered with the Clinical Trial Registry of India (CTRI REG NO: CTRI/2023/10/058230), and informed consent was obtained from all patients and experts involved.

Inclusion Criteria: The study included four males and six females, aged 25–45, diagnosed with *Amlapitta* according to *Ayurvedic* principles, all of whom were already receiving *Ayurvedic* oral medications based on symptomatic diagnosis.

Exclusion Criteria: Participants with hearing impairments, those unable to write or speak English, and individuals already enrolled in other music programs were excluded.

Intervention: Music sessions were conducted online via Google Meet, allowing participants to listen through headphones at lower volumes (50–70 dB) which allows enjoyable listening [35]. The study featured pre-recorded instrumental pieces in *Sitar* and *Rudraveena* played at 396 Hz, considered a favourable frequency for humans [36]. Participants listened to four specific *Ragas*: *Bhairav* in the morning, *Basanta Mukhari* in the afternoon, *Puriya Dhanasree* in the evening, and *Basant* at night, for 15 minutes each session, six days a week

for six weeks. **Figure 2** below shows the twenty-four validated *Ragas* for *Pitta* imbalance based on Diurnal circadian cycle of *Vata*, *Pitta* and *Kapha* and **Figure 3** below shows the Diurnal circadian cycle of *Vata*, *Pitta* *Kapha* and the appropriate *Raga* matched based on the time theory of *Ragas* taken for feasibility test.

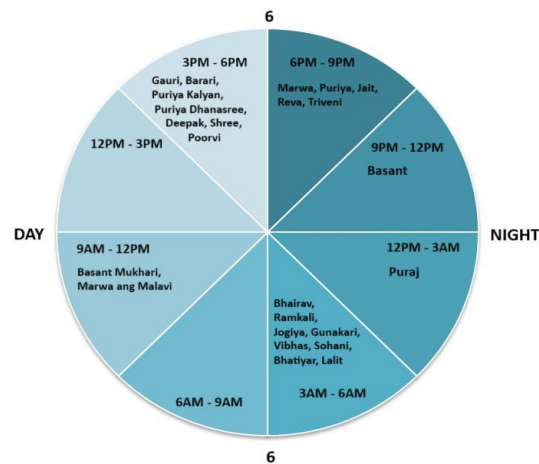


Figure 2 Validated Ragas for Pitta imbalance based on Diurnal circadian cycle of Vata, Pitta and Kapha

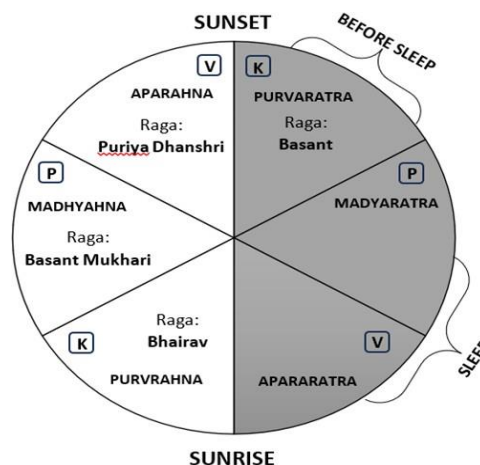


Figure 3 Diurnal circadian cycle of Vata, Pitta, Kapha and the appropriate Raga based on the time theory of Ragas taken for feasibility test for managing Amplapitta

Sample Size: The study was executed as a pilot study to generate the safety and efficacy data on the trial intervention, thus a sample size of ten, was fixed.

Statistical Methods: The statistical analysis was done by Statistical Package for the Social Sciences (SPSS) software using a paired sample t-test. Mean, standard deviation and P-value were calculated.

RESULTS

The results are presented in three sections: I. Validation of the RM by the experts, II. acceptability and feasibility of the RM, and III. effectiveness of the RM.

I. VALIDATION OF THE RM

The validation process involved listing 24 Ragas based on classical and contemporary literature, all of which were included in the developed RM. Fifteen experts assessed the Ragas: 1 PhD, 9 postgraduates, and graduates, aged 30-50 years (average 38.4 ± 3.9). The group included 2 men and 13 women, with an average

of 15.2 ± 7 years of formal music training. The experts were from different Music institutes and were familiar with both Hindustani and Carnatic forms. They were certified by the Health Sector Skill Council (HSSC) in Music therapy. All 24 Ragas with a CVR >0.49 were retained in the final RM. Table 1 gives the list of Ragas validated and the time of the Raga validated along with their respective CVR ratio.

Table 1. Time of singing/listening to the Raga with their CVR ratio.

Thaat	Ragas	Time of Singing	Experts rated 0	Experts rated 1	Experts rated 2	Experts rated 3	Experts rated 4	Experts rated ≥ 3 (Ne)	Total Experts (N)	Content Validity Ratio (CVR)
Bhairav	Bhairav	4 - 7 am	0	0	0	4	11	15	15	1.00
	Ramkali	4 - 7 am	0	0	1	8	6	14	15	0.87
	Jogiya	4 - 7 am	0	0	0	5	10	15	15	1.00
	Gauri (Bhariav Ang)	4 - 7 pm	0	0	0	6	9	15	15	1.00
	Gunakari	4 - 7 am	0	0	0	7	8	15	15	1.00
	Vibhas	4 - 7 am	0	0	0	2	13	15	15	1.00
	Basant Mukhari	10 am - 1 pm	0	0	0	9	6	15	15	1.00
Marwa	Marwa	7 - 10 pm	0	0	0	2	13	15	15	1.00
	Sohani	4 - 7 am	0	0	0	3	12	15	15	1.00
	Puriya	7 - 10 pm	0	0	0	4	11	15	15	1.00
	Jait	7 - 10 pm	0	0	0	5	10	15	15	1.00
	Bhatiyar	4 - 7 am	0	0	0	2	13	15	15	1.00
	Barari	4 - 7 pm	0	0	0	5	10	15	15	1.00
	Puriya Kalyan	4 - 7 pm	0	0	0	2	13	15	15	1.00
	Marwa Ang Malavi	10 am - 1 pm	0	0	0	1	14	15	15	1.00
	Lalit	4 - 7 am	0	0	0	2	13	15	15	1.00
Purvi	Reva	7 - 10 pm	0	0	0	2	13	15	15	1.00
	Basant	10 pm - 1 am	0	0	1	1	13	14	15	0.87
	Puriya Dhanasree	4 - 7 pm	0	0	0	2	13	15	15	1.00
	Paraj	1 - 4 am	0	0	0	3	12	15	15	1.00
	Triveni	7 - 10 am	0	0	0	4	11	15	15	1.00
	Deepak	4 - 7 pm	0	0	0	5	10	15	15	1.00
	Shree	4 - 7 pm	0	0	0	6	9	15	15	1.00
	Poorvi	4 - 7 pm	0	0	0	3	12	15	15	1.00

II. ACCEPTABILITY AND FEASIBILITY OF RM

All ten participants (Four males, six females) completed the study without dropouts, unanimously recommending the music intervention to others indicates strong acceptability.

III. EFFECTIVENESS OF THE RM

Using the PPAT, pre-intervention results showed all participants had a predominance of *Pitta* ($Pitta = 370.5 \pm 33.3$, $Vata = 205 \pm 94.5$, $Kapha = 202 \pm 62.7$). Six had *Pitta* with *Vata*, and four with *Kapha*. Post-intervention, *Pitta* imbalance significantly decreased, with VTDS scores dropping from 11.5 ± 2.1 to 4.8 ± 1.8 ($P = 0.001$). Psychological symptoms, especially the anger trait, improved from 1 ± 0 to 0.3 ± 0.5 ($P = 0.001$). Reductions were also noted for *Vata* (5.8 ± 1.2 to 2.7 ± 1.4 , $P = 0.001$) and *Kapha* (3.6 ± 1.1 to 2.4 ± 1.1 , $P = 0.002$). The results demonstrate the RM's feasibility and effectiveness in addressing both the psychological and physiological aspects of *Amlapitta*.

DISCUSSION

Numerous studies support the therapeutic benefits of Indian *Ragas*; however, the specific mechanisms of a structured RM aligned with time theory and its expert validation for addressing the psychological aspects of *Pitta* imbalance have not been explored. *Pitta*-related diseases include stress, hypertension, coronary issues, cancers, psoriasis, infections, spleen inflammation, hepatitis, urinary tract infections, and hyperacidity.^[37] This RM is acceptable, easy to administer, and feasible for patients with hyperacidity or *Amlapitta* (GERD). Listening to appropriate *Ragas* at optimal times is thought to align the body and mind with the circadian

cycle.^[14] Significant improvements were observed in ten participants, with reductions in *Pitta*, *Vata*, and *Kapha* scores, as well as decreased anger traits. *Ragas* have been shown to help manage stress-related diseases, hypertension, and heart conditions.^{[38][39][40][41][42]}

The mind-body connection is crucial in treating functional gastrointestinal disorders, as the "gut-brain axis" has more neurons than any other part of the body, indicating that negative emotions can worsen gastrointestinal symptoms.^[43] *Ragas* featuring *Komal ri* (Db minor second) and *Komal dha* (Bb minor sixth) promote emotional healing by infusing *Shanta Rasa*, replacing negative emotions with positive ones.^[44] *Patanjali's Sutra* (2.33) advises countering negative thoughts with their opposites^[45]. The harmonic tension created by Db and Bb fosters emotional release, like the nuanced expression found in jazz and blues.^[46]

This study supports that engaging with *Ragas* evoking Peace and Compassion can alleviate the anger trait linked to *Pitta* imbalance, aligning with SVS and literature indicating effectiveness in reducing stress and heart diseases.

Strengths of the Study: This feasibility study confirms the validated RM's usefulness and acceptability for *Amlapitta*, with all participants reporting enhanced relaxation and no adverse effects or dropouts, suggesting its potential application in other *Pitta*-related diseases.

Limitations: The study's feasibility testing had a small sample size and lacked a control group and objective variables.

Conclusions: This study introduces a validated RM of twenty-four *Ragas* designed to address *Pitta* imbalance, demonstrating feasibility and acceptability for *Amlapitta* patients. We recommend the module for various *Pitta*-related conditions, including stress-related diseases.

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