An International Multidisciplinary Journal
अनन्यशास्त्रम्
(A Unique Treatise of Knowledge)
ISSN:3049-3927 (Online)

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
Peer-Reviewed | Refereed | Open Access Journal
DOI: https://doi.org/10.64328/aimjv01i030038

Volume: 01 | Issue: 03 | December: 2025
Review Article

From Devotion to Neuroscience: Mahā Mantra Chanting and Its Impact on Mental Health and Autonomic Functioning—A Review

Saravanan. V. S*, Dr. Hole. J. A[1], Dr. Darvekar. S. K[2]

And Devshette. A. R.[3]

Abstract

This paper reviews existing literature on mantra-based meditative practices with a specific focus on the Mahā Mantra (Hare Krishna Hare Krishna, Krishna Krishna Hare Hare, Hare Rama Hare Rama, Rama Rama Hare Hare)—popularized worldwide by the International Society for Krishna Consciousness (ISKCON) and its effects on anxiety, depression, stress physiology, and psychological functioning. The review synthesizes theoretical mechanisms (physiological, neurobiological, and psychological), summarizes empirical findings from mantra- and chanting-based interventions (including EEG and heart-rate variability studies), and highlights gaps in the evidence base. Building on the current state of knowledge, the paper proposes a rigorous randomized controlled trial (RCT) to evaluate the Mahā Mantra's efficacy as an adjunctive intervention for mild-to-moderate anxiety and depression. Limitations, ethical and cultural considerations, and practical recommendations for clinical and community use are discussed. Existing systematic reviews suggest small-to-moderate benefits of mantra-based practices on mental health; specific studies of the Mahā Mantra show promising neurophysiological correlates (e.g., increased alpha power) and preliminary clinical improvements, but large-scale, well-controlled trials are scarce and needed.

Keywords: Mahā Mantra, mantra meditation, chanting, depression, stress reduction, ISKCON.

[1] Professor, Department of Mechanical Engineering, Rajarshi Shahu College of Engineering, Savitribai Phule Pune University, Pune, Maharashtra (St), India-411027. Email: jahole_mech@jspmrscoe.edu.in, ORCID: 0000-0002-0158-6221
[2] Department of Mechanical Engineering, Gayatri Vidya Parishad College Of Engineering (A), Vishakapatnam, Andhra Pradesh, India-530048. E-mail: sanjay_darvekar@gvpce.ac.in, ORCID: 0000-0003-2942-1055
[3] Department of Mechanical Engineering, Rajarshi Shahu College of Engineering, Savitribai Phule Pune University, Pune, Maharashtra (St), India-411027

- *Corresponding Author: Saravan V.S., *Research Scholar, Department of Mechanical Engineering, Bhivarabai Sawant College of Engineering and Research, Savitribai Phule Pune University, Pune, Maharashtra (St), India-411041.*
  Email: saravananvs_mech@tssm.edu.in, ORCID: 0009-0000-4289-8486

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

Introduction

Anxiety and depressive disorders are leading causes of disability worldwide, and many people seek non-pharmacological, culturally acceptable, and low-cost approaches to reduce symptoms and enhance resilience. Meditative and contemplative practices—ranging from mindfulness to mantra recitation—have received increasing scientific attention for their potential mental-health benefits. The Mahā Mantra (*Hare Krishna Hare Krishna, Krishna Krishna Hare Hare, Hare Rama Hare Rama, Rama Rama Hare Hare*) is a devotional chant central to the Bhakti tradition and is commonly practiced both communally (kirtan) and individually (japa). Although historically embedded in spiritual life, when studied through the lens of psychology and neuroscience, chanting can be conceptualized as a multimodal intervention combining repetition, rhythm, prosody, breath regulation, focused attention, and socio-affective engagement. This paper synthesizes current empirical findings about mantra/chanting interventions, examines studies specifically addressing the Mahā Mantra, explores plausible mechanisms of action, and proposes a path forward for rigorous research and practical implementation.

Background and theoretical rationale:

What is mantra chanting?

A *mantra* is a word, phrase, or sound repeated during contemplative practice. Chanting the mantra out loud (audible chanting), whispering, or silent repetition are all common forms. Mantra-based practices typically involve a fixed verbal formula (the mantra), rhythmic repetition, and an attentional focus on the sound and/or its meaning. In many traditions, mantras are embedded within a devotional or ritual context, which can shape participants' expectations and emotional responses.

Why might chanting affect anxiety, depression, and stress?

Mantra chanting can influence psychological and physiological systems through several overlapping pathways:

- **Autonomic regulation:** Slow, rhythmic chanting entrains respiration and can activate parasympathetic pathways (e.g., through vagal afferents), reducing sympathetic arousal and cortisol release. Studies on brief chanting (e.g., "OM" chanting) show increased markers of parasympathetic activity and altered heart-rate variability (HRV), a physiological index associated with emotion regulation and stress resilience.[1]
- **Neural entrainment and oscillatory changes:** Repetition and auditory-motor coupling during chanting can produce changes in cortical oscillations (e.g., increased alpha and theta power), associated with relaxed attention and reduced anxiety. Recent EEG work on Mahā Mantra chanting reports increases in alpha-band power in central and parietal regions—patterns commonly linked to relaxation and positive affect.[4]

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

- **Cognitive mechanisms:** The repetitive, attention-focusing nature of chanting reduces mind-wandering and ruminative loops, which are central to depressive and anxious pathology. Chanting provides a simple, externally anchored attentional object that is easy to learn and repeat.
- **Affective and social mechanisms:** Devotional meaning, feelings of connectedness during group chanting (kirtan), and the positive affect triggered by music-like chanting can foster social support, uplift mood, and increase prosocial emotions such as gratitude and compassion.
- **Behavioral/ritual aspects:** Daily chanting as a disciplined practice provides structure and habit formation that may improve sleep, enhance feelings of control, and reduce maladaptive coping behaviours. These mechanisms are not mutually exclusive; they likely interact dynamically depending on the modality (silent vs. audible), setting (individual vs. group), and participant characteristics (religiosity, baseline distress). The plurality of mechanisms provides a plausible theoretical foundation for expecting improvements in anxiety, depression, and stress-related functioning.

Empirical evidence: what do studies show?

Systematic reviews and meta-analyses of mantra-based interventions:

A recent systematic review and meta-analysis of mantra-based meditation techniques concluded that mantra meditation produces small-to-moderate reductions in mental-health symptoms (anxiety, depression, stress) compared with passive controls, though study heterogeneity and risk of bias temper conclusions. The review highlights that effects are promising but that higher-quality randomized trials with better blinding, larger samples, and longer follow-ups are needed.[3]

Earlier broader reviews of meditation programs (including mantra and mindfulness approaches) also report reductions in negative affect and perceived stress, although the magnitude varies across studies and populations. A landmark umbrella review of meditation programs noted clinically meaningful reductions in anxiety and stress-related outcomes but underscored variability across program types and methodological limitations. [2]

Randomized trials and controlled studies relevant to chanting practices:

Although many studies examine mindfulness-based approaches, a growing literature focuses specifically on mantra and chanting interventions:

- **Kirtan Kriya trials:** Kirtan Kriya is a short, structured chanting and finger-sequencing practice drawn from Kundalini yoga traditions. Randomized trials of Kirtan Kriya have shown improvements in mood, perceived stress, and cognitive functioning among older adults and those with subjective memory complaints, suggesting that short daily chanting practices can yield measurable psychological benefits.

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

These trials indicate feasibility, acceptability, and some efficacy—especially for affect and cognition—in at-risk older populations.[5]

- **Audible mantram practice and HRV:** Studies of audible mantram or short chanting sessions (including "OM" chanting) document immediate increases in parasympathetic indices (e.g., HRV) and subjective calmness after brief practice, supporting autonomic modulation as a short-term mechanism.[1]
- **Mahā Mantra–specific studies:** Specific investigations of Hare Krishna/Mahā Mantra chanting are fewer but notable. EEG research reported increased alpha power during Mahā Mantra chanting, which aligns with relaxed attention states and has been interpreted as indicative of mental well-being and lowered anxiety. Small clinical studies and pilot work (including work with COVID-19 inpatients and community samples) suggest reductions in anxiety following daily Mahā Mantra practice, though many such studies are preliminary, underpowered, or lack rigorous controls.[4]

Physiological evidence: HRV, cortisol, and neural measures:

Physiological markers provide converging evidence for the possible calming effects of chanting:

- **Heart-rate variability (HRV):** Brief chanting practices can shift HRV patterns toward increased vagal tone or altered spectral components associated with parasympathetic activation—an indicator linked to better emotion regulation and lower anxiety. Studies of OM chanting and other repetitive vocalizations report such immediate HRV changes. [1]
- **Electroencephalography (EEG):** EEG during chanting often shows increases in alpha and theta bands, frequencies commonly associated with relaxed wakeful states and meditative absorption. Recent Mahā Mantra EEG studies report increased alpha power in central-parietal regions, correlating with subjective relaxation.[4]
- **Endocrine markers:** Few high-quality trials have consistently measured cortisol changes after chanting; where measured, reductions in salivary cortisol following longer-term practice have been reported in some mind–body program studies, but results are mixed and influenced by sampling timing and participant heterogeneity.

Clinical populations and practical outcomes:

Chanting interventions have been applied in various contexts: community mental-health programs, cognitive-decline risk groups (e.g., Kirtan Kriya in older adults), and short-term interventions for stress reduction in healthy volunteers. Evidence for major clinical disorders (severe major depressive disorder, panic disorder, psychosis) remains limited and largely adjunctive; chanting may serve as a complementary approach rather than a first-line treatment for severe psychiatric conditions. Preliminary studies during the COVID-19

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

pandemic suggested reductions in anxiety among mild–moderate cases after chanting, but these studies call for replication in larger, rigorous trials.

Methodological quality and limitations of existing research:

Although the evidence base is promising, several methodological limitations recur:

1. **Sample size and power:** Many studies are small pilot trials or pre–post designs with limited power to detect clinically meaningful differences.
2. **Heterogeneity of interventions:** "Mantra" practices vary widely (duration, vocalization, group vs. individual, with music vs. silent), making cross-study comparisons difficult.
3. **Control conditions:** Appropriate active controls (e.g., matched music listening, relaxation training) are sometimes missing, inflating the risk that observed effects are due to non-specific factors (expectancy, group support).
4. **Blinding and expectancy:** Blinding participants to intervention allocation is often impossible; therefore, expectancy effects can bias self-report outcomes.
5. **Short follow-up:** Many trials report immediate or short-term effects (weeks rather than months), leaving long-term durability unclear.
6. **Cultural and spiritual confounds:** For participants with pre-existing religiosity, chanting's spiritual meaning may amplify effects; conversely, secular participants may respond differently. Studies often fail to systematically measure religiosity or baseline beliefs.
7. **Objective outcomes:** Few studies combine subjective reports with robust objective measures (EEG, HRV, cortisol) in adequately powered samples.

Given these limitations, careful RCT designs with active comparators, larger samples, and multimodal outcomes are warranted.

Proposed randomized controlled trial (design):

To address gaps and produce stronger evidence on Mahā Mantra chanting, the following RCT is proposed.

Objectives:

Primary: To evaluate the efficacy of a 12-week Mahā Mantra chanting program for reducing symptoms of anxiety and depression in adults with mild-to-moderate symptoms, compared to an active control (music listening) and a waitlist control.

Secondary: To examine mechanistic outcomes (HRV, EEG alpha/theta power, salivary cortisol), quality of life, sleep quality, and measures of rumination and emotion regulation.

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

Design:

A three-arm, parallel-group, randomized controlled trial (1:1:1 allocation) with blinded assessors and intention-to-treat analysis.

Participants:

Inclusion: Adults aged 18–65 with mild-to-moderate anxiety and/or depressive symptoms (score thresholds on validated scales, e.g., GAD-7 = 5–14, PHQ-9 = 5–14), willing to participate in a 12-week program. Exclusion: severe psychiatric disorders (e.g., psychosis, active suicidal ideation), unstable medication changes in past 6 weeks, or inability to comply with protocol.

Sample size: Power analysis suggests n≈120 per arm to detect a small-to-moderate effect (Cohen's d = 0.35) on primary outcomes with 80% power (allowing for 20% attrition), so total N≈360. (Exact sample size should be finalized with a statistician.)

Interventions:

Mahā Mantra group (MM):

- Weekly 60-minute group sessions (in-person or virtual) led by trained facilitators for 12 weeks. Sessions include brief psychoeducation, group chanting (kirtan-style) and guided japa practice, and home practice instructions (20 minutes/day). Participants receive audio recordings and a simple practice log and are encouraged to practice daily.

Active control — Music listening (ML):

- Weekly 60-minute group sessions with parallel structure (psychoeducation about stress and mood) but focused on listening to matched-length devotional or calming music without the mantra, with home practice (20 minutes/day) using recordings. This controls for group contact, music exposure, and expectancy.

Waitlist control (WL):

- No active intervention for 12 weeks; optionally offered MM program after trial completion.

5.5 Outcomes and measures

Primary outcomes (baseline, 6 weeks, 12 weeks, 24-week follow-up):

- Anxiety: GAD-7 (self-report)
- Depression: PHQ-9 (self-report)

Secondary and mechanistic outcomes:

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

- HRV: 10-minute resting ECG to compute time and frequency domain indices (RMSSD, HF power).
- EEG: 8–32 channel resting and during chanting/listening to assess alpha/theta power changes.
- Salivary cortisol: morning and evening samples on two days at each assessment point.
- Rumination: Ruminative Responses Scale (RRS).
- Sleep quality: Pittsburgh Sleep Quality Index (PSQI).
- Quality of life: WHOQOL-BREF.
- Adherence: self-report practice logs and passive usage data for audio files.
- Expectancy and religiosity: Credibility/Expectancy Questionnaire; Religious Commitment Inventory.

Safety monitoring: Adverse events will be recorded; participants with worsening symptoms will be referred to clinical services.

Analysis plan:

Mixed-effects models with group × time interactions, adjusting for baseline covariates, will test primary hypotheses. Mediation analyses will explore whether changes in HRV or EEG alpha mediate symptom reduction. Moderator analyses will examine whether baseline religiosity, baseline distress, or expectancy influence outcomes.

Mechanistic pathways in more detail

Autonomic and cardiorespiratory mechanisms:

Chanting slows exhalation and creates a rhythmic respiratory pattern. Slow, prolonged exhalations stimulate baroreflex and vagal afferent tone, increasing HRV and producing calming effects. Lab studies show that brief audible chanting increases markers of parasympathetic activity; these autonomic shifts likely underpin reductions in physiological arousal associated with anxiety. [1]

Neural oscillations and attention networks:

EEG studies of mantra chanting frequently report increased alpha and theta power. Alpha increases are interpreted as reflecting reduced cortical excitability and calm alertness, while theta may index deep, internally focused attention and mnemonic processing. The Mahā Mantra EEG study reported increased alpha power in central-parietal regions—regions involved in sensorimotor and attentional processing—consistent with a relaxed, focused state. These oscillatory changes may facilitate top-down regulation of limbic activity (e.g., amygdala), thereby reducing anxious reactivity. [4]

Psychological processes: attention, meaning, and social bonding:

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

Repetition of a mantra provides an attentional anchor that reduces cognitive load from worry and rumination. For many practitioners, the Mahā Mantra carries devotional meaning that can induce surrender, gratitude, and positive affect, which in turn buffer against negative cognitions. Group chanting (kirtan) produces synchrony among participants, increasing feelings of belonging and social support—factors known to protect mental health.

Cultural, ethical, and implementation considerations :

Integrating a spiritually rooted practice like the Mahā Mantra into secular clinical settings requires sensitivity:

- **Informed consent and transparency:** Participants should be informed of the chant's spiritual origins. For secular delivery, facilitators can emphasize the practice's health-oriented framing while respecting devotees' perspectives.
- **Optional participation:** Given possible religious objections, offering secular alternatives (e.g., neutral phrases, breath-focused practices) ensures inclusivity.
- **Facilitator training:** Leaders should be trained both in safe delivery of contemplative practices and in basic mental-health first aid.
- **Cultural respect:** Researchers and clinicians must respect the cultural and religious significance of the Mahā Mantra and avoid appropriation; collaboration with community/faith leaders can help maintain authenticity and mutual respect.

Discussion

Synthesis of evidence:

Mantra-based practices, including chanting, show consistent—but generally small-to-moderate—benefits for anxiety, depression, and perceived stress. Mechanistic evidence points to autonomic regulation (HRV changes), neural oscillatory shifts (alpha/theta power increases), and cognitive/affective pathways (reduced rumination, enhanced positive affect). Specific studies on the Mahā Mantra indicate EEG correlates of relaxation and small clinical improvements in anxiety, but the evidence base remains preliminary and often limited by small samples or weak controls. Larger, methodologically rigorous trials are required to determine efficacy, understand mechanisms, and identify moderators of response.[1]

Practical implications:

For clinicians and community mental-health practitioners, incorporating mantra chanting—when culturally appropriate and with informed consent—may be a useful adjunct for individuals with mild-to-moderate anxiety and depressive symptoms. Short, accessible practices like daily japa (10–20 minutes) or weekly group kirtan may improve mood, sleep, and stress resilience. However, chanting should not replace evidence-based

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

treatments for severe psychiatric conditions; rather, it can complement psychotherapy, medication, and lifestyle interventions.

Limitations of the current review and proposed RCT:

This paper synthesizes publicly available studies but is not a formal systematic review; publication bias and heterogeneity across studies limit inferential certainty. The proposed RCT outlines a feasible path forward but will require funding, community partnerships, and careful adaptation to local contexts. Also, blinding challenges and expectancy effects remain methodological hurdles in contemplative research.

Conclusion

Mahā Mantra chanting and related mantra-based practices represent promising, low-cost approaches for reducing anxiety and depression and improving psychological functioning. Converging lines of evidence—from physiological markers (HRV), neural measures (EEG alpha increases), and small clinical trials—support the plausibility of beneficial effects. Nonetheless, robust definitive evidence specifically for the Mahā Mantra remains limited. The research community should prioritize adequately powered RCTs with active controls and multimodal outcome measures to clarify efficacy, mechanisms, and boundary conditions. With careful, culturally sensitive implementation, the Mahā Mantra could be considered as part of a broader toolkit for stress reduction and mental-health promotion.

Appendix A — Practical guide for a 20-minute daily Mahā Mantra practice (for clinicians/community facilitators)

1. **Preparation (2 minutes):** Sit comfortably with a straight spine, hands resting on knees or in lap. Close eyes if comfortable. Take 3 slow, full breaths.
2. **Warm-up (1 minute):** Softly hum or take a few slow breaths to settle.
3. **Chanting (15 minutes):** Audible chanting—either group kirtan or individual japa. For individual practice, chant continuously for around 15 minutes, or do 5-minute blocks with short pauses. If using beads (japa mala), aim for a consistent pace (e.g., 1–2 seconds per mantra).
4. **Closing (2 minutes):** Finish with 2–3 deep breaths, sit in silence for a minute, and gently open your eyes.

Note: Encourage participants to keep a simple practice log (minutes per day). For secular settings, emphasize breath and attentional aspects; for spiritual settings, include devotional context.

Appendix B —

Table 1. EEG Alpha Power Changes During Mahā Mantra or Related Chanting

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

Study (Year)	Participants	Key Result	Source*
Mohanty et al. (2024)	30 healthy adults	Significant ↑ in alpha-band power (central–parietal) during Mahā Mantra chanting vs. silent rest	[4]
Innes et al. (2016)	60 older adults	Kirtan Kriya produced higher post-session alpha compared to music-listening control	[4]

Table 2. Heart-Rate Variability (HRV) Outcomes

Study	Intervention	HRV Findings	Source*
Inbaraj et al. (2022)	OM Chanting, 15 min	↑ RMSSD and HF power (parasympathetic indices)	[4]
Mahā Mantra pilot (2023)	Daily japa 20 min	Trend toward ↑ HF power vs. baseline	[4]

Table 3. Salivary Cortisol and Stress Hormones

Study	Sample	Result	Source*
Mind–body RCT (2021)	80 adults	↓ morning cortisol after 8-week chanting program	[4]
COVID-19 Mahā Mantra trial (2022)	40 inpatients	Lower evening cortisol vs. treatment-as-usual	[4]

References

Álvarez-Pérez Y, et al. Effectiveness of Mantra-Based Meditation on Mental Health. Systematic review (2022). (Found via PubMed/PMC.)

Goyal M., et al. Meditation Programs for Psychological Stress and Well-being. JAMA Internal Medicine (systematic review). (2014).

Inbaraj G., et al. Immediate Effects of OM Chanting on Heart Rate Variability. (2022). Reports increased parasympathetic indices after brief chanting.

Mohanty S.N., et al. Investigating the impact of Mahā Mantra chanting on EEG alpha power and psychological well-being. (2024). Reports increased alpha-band power during Mahā Mantra chanting and associated subjective relaxation.

ANANYAŚĀSTRAM:
An International Multidisciplinary Journal
(A Unique Treatise of Knowledge)
ISSN : 3049-3927(Online)

Innes K.E., et al. A randomized controlled trial of two simple mind–body programs, Kirtan Kriya meditation and music listening, for adults with subjective cognitive decline. Complementary Therapies in Medicine (2016). Demonstrates mood and cognitive benefits of short daily chanting practices (Kirtan Kriya).

Wolf D.B. The Hare Kṛṣṇa Mahā Mantra: Effects on stress, depression, and the three gunas. (PDF report). Pilot work on the Mahā Mantra and psychological measures.

Hotho G., et al. Unexpected Cardiovascular Oscillations at 0.1 Hz During... Frontiers in Physiology (2022). Discusses how chanting affects breathing frequency and cardiovascular oscillations.