Effects of Trimūrti Dhyāna on Heart Rate Variability and Three Gunas: A Pilot Study Based on Dhyānabindu Upanisad

Chanchal Surywanshi et al.

Neetinakumar J. Patil, Vinutha Shankar, Smitha P. S., Venkateswarlu Raavi, Dhanashri Patil

This pilot study investigates the psychophysiological effects of *Trimūrti Dhyāna*, a visualization-based meditative practice described in the *Dhyānabindu Upaniṣad*, on Heart Rate Variability (HRV) and the modulation of the *three Guṇas – Sattva*, *Rajas*, and *Tamas*. Thirty healthy male students were randomly assigned to either a meditation group (N = 15) practicing *Trimūrti Dhyāna* for six weeks or a control group (N = 15). Pre- and post-intervention assessments included HRV parameters and psychological profiling using the *Vedic Personality Inventory*. The *Dhyāna* group showed a significant increase in *Sattva* and a reduction in *Rajas* and *Tamas* scores. While most HRV changes were not statistically significant, favorable trends were observed, and LF power showed a significant decrease. These preliminary results suggest that *Trimūrti Dhyāna* may enhance psychological balance and autonomic regulation, warranting further large-scale investigation.

← *Photography © 2025 Gréta Zubová*

Dr. Neetinakumar J. Patil, MD, PhD, is an Additional Professor at the Centre for Integrative Medicine and Research at Manipal Academy of Higher Education in India, and former Head of the Department of Integrative Medicine at Sri Devaraj Urs Academy of Higher Education and Research, Kolar, India. He has authored numerous publications and led several funded research projects as principal investigator. An invited speaker at national and international conferences, his expertise spans Ayurveda, Yoga, and integrative medicine. He can be reached at patil.nj@manipal.edu.

orcid.org

Chanchal Surywanshi, Sri Devaraj Urs Academy of Higher Education and Research, Karnataka, India.

Neetinakumar J. Patil, Centre for Integrative Medicine and Research, Manipal Academy of Higher Education, Manipal, Karnataka, India.

Vinutha Shankar, Sri Devaraj Urs Medical College, Karnataka, India.

Smitha P. S., Sapthagiri Institute of Medical Sciences and Research Centre, Bangalore, India.

Venkateswarlu Raavi, Sri Devaraj Urs Academy of Higher Education and Research, Karnataka, India.

Dhanashri Patil, SDM College of Ayurveda, Udupi, India.

Received July 15, 2025
Revised September 8, 2025
Accepted September 9, 2025

Keywords
Meditation, psychology, stress, Dhyānabindu Upaniṣad, yoga

1 Introduction

Meditation, as a spiritual discipline, holds a central place in the *Upaniṣadic* vision of self-realization and inner transformation. Among the various meditative practices described in these ancient scriptures, *Trimūrti Dhyāna*, as elucidated in the *Dhyānabindu Upaniṣad*, offers a contemplative visualization technique that focuses on the divine trinity of *Brahmā* (creation), *Viṣṇu* (preservation), and *Śiva* (transformation). This symbolic *Dhyāna* (meditation), practiced with devotion and inner stillness, is designed to harmonize the practitioner's inner energies with the cosmic cycle of becoming and dissolution (Grimes 1995, 11; Jansen 2007, 23).

The *Yoga Upaniṣads*, particularly the *Dhyānabindu*, underscore meditation not merely as a relaxation technique but as a path to transcendental awareness and spiritual equanimity (Flood 1996, 61; White 2012, 24). However, contemporary scientific inquiry increasingly explores how such traditional practices affect measurable psychophysiological parameters, bridging the gap between spirituality and empirical evidence.

Heart Rate Variability (HRV) has emerged as a prominent biomarker in psychophysiological research, reflecting the autonomic nervous system's ability to adapt to internal and external stimuli. A higher HRV is generally associated with enhanced parasympathetic activity, emotional regulation, and stress resilience (Thayer *et al.* 2012, 747; Lehrer and Gevirtz 2014, 756). Meanwhile, Indian psychological thought, especially as operationalized through the *Three Guṇas* framework – *Sattva* (balance and clarity), *Rajas* (activity and restlessness), and *Tamas* (inertia and ignorance) – offers a spiritually grounded lens to assess personality and mental states (Das 1991, 51; Wolf 1999, 1384).

Despite the growing popularity of meditation-based interventions worldwide, empirical studies exploring *Upaniṣadic* techniques like *Trimūrti Dhyāna* remain scarce. Practices such as Transcendental Meditation, Vipassana, and Heartfulness have demonstrated beneficial effects on HRV and emotional regulation (Bin Waleed *et al.* 2022; Krygier *et al.* 2013, 307), yet the spiritual depths and philosophical insights embedded in *Trimūrti Dhyāna* are yet to be thoroughly examined through modern scientific methods.

Although very few empirical studies exist on *Trimūrti Dhyāna* specifically, some scholarly works have examined the symbolic, cosmological, and philosophical foundations relevant to its framework. Bailey (2014, 1622) offers insights into Śiva's transformative symbolism, Leeming (2020) discusses Viṣṇu's role as a preserver in the spiritual psyche, Markel (2024, 37) provides a broader cosmological context linking the *Trimūrti* concept to Hindu mythology, and Deussen (2010) outlines the Upaniṣadic philosophical foundations that inform such meditative practices. These perspectives highlight the spiritual depth underlying *Trimūrti Dhyāna*, yet there remains a lack of rigorous psychophysiological evaluation, underscoring the need for the current investigation.

This study does not merely comment on Upaniṣadic texts but presents the structured development of a novel meditation technique – *Trimūrti Dhyāna* – conceptualized from Yogic scriptures and validated through expert consensus. According to Patañjali's *Yoga Sūtras*, *Dhyāna* (meditation) is the seventh limb of *Ashtanga Yoga* and is preceded by *Dhāraṇā* (concentration). *Dhāraṇā* involves focused attention on a single object or concept, and when this concentration becomes uninterrupted and stable, it evolves into *Dhyāna* – a state of continuous meditative absorption (*Yoga Sūtra* 3:1–2). In this context, *Trimūrti Dhyāna* follows this classical framework, wherein each phase – symbolic visualization of *Brahmā*, *Viṣṇu*, and *Śiva* – is designed to facilitate focused *Dhāraṇā*, gradually deepening into *Dhyāna*. It integrates symbolic focus, breath awareness, and mantra recitation in three distinct stages reflecting the energies of *Brahmā* (creation), *Viṣṇu* (preservation), and *Śiva* (dissolution) (Surywanshi and Patil 2022, 141).

This pilot study aims to address this gap by evaluating the impact of a six-week *Trimūrti Dhyāna* intervention on HRV parameters and the modulation of *three Guṇas*, using both physiological tools and the *Vedic Personality Inventory* (VPI) (Wolf 1999, 1379–1390). By integrating ancient yogic philosophy with contemporary psychophysiological metrics, this research not only contributes to the empirical validation of a spiritually significant meditation technique but also supports a holistic approach to well-being that respects both the spiritual and scientific dimensions of human experience. We hypothesize that regular practice of *Trimūrti Dhyāna* may result in a measurable increase in sattvic trait and HRV parameters reflecting improved parasympathetic activation.

2 Methodology

2.1 Study Design and Setting

The *Trimūrti Dhyāna* technique was developed and evaluated as a part of a doctoral research project approved by the Institutional Ethics Committee (Ref. SDUAHER/KLR/CEC/69/2021–22). The development process involved three structured phases:

1. Conceptualization based on a critical textual review of the *Dhyānabindu Upaniṣad* along with consultative dialogues with seven yoga scholars.

2. Systematic design of a multi-phase meditative practice integrating mantra recitation, breath awareness, and symbolic visualization across 20 meditative steps.

3. Content validation through expert feedback (N = 10) using Lawshe's method of *Content Validity Ratio* (CVR), which yielded a mean CVR score of 0.92, indicating strong expert agreement (Surywanshi and Patil 2024, 152).

The intervention was carried out at the Department of Integrative Medicine, in association with the Department of Physiology, Sri Devaraj Urs Academy of Higher Education and Research (SDUAHER), Kolar, Karnataka, India. A qualified Ph.D. Research Scholar in Yoga, who conceptualized the technique and holds formal degrees and training in meditative disciplines, facilitated the sessions.

Each session lasted 20 minutes, conducted five days a week for six consecutive weeks in a group setting, with live verbal instructions to maintain procedural uniformity. The practice was divided into three symbolic stages aligned with *Brahmā* (creation), *Viṣṇu* (preservation), and *Śiva* (dissolution), incorporating regulated breathing, mantra chanting, and internal visualization.

Pre- and post-intervention assessments included both *Heart Rate Variability* (HRV) parameters and *three Guṇas*-based personality profiling using the *Vedic Personality Inventory* (VPI), thereby combining physiological and psychological measures to evaluate the efficacy of the intervention.

2.2 Participants and Recruitment

A total of 30 healthy male undergraduate students, aged between 18 and 30 years, were selected through purposive sampling based on well-defined inclusion and exclusion criteria, aiming to ensure physiological homogeneity and reduce inter-individual variability in HRV and *three Guṇas* profiles. Participants were recruited from the Department of Integrative Medicine at Sri Devaraj Urs Academy of Higher Education and Research (SDUAHER), Kolar, via institutional advertisements and informational briefings. Although the sampling was non-probabilistic, randomization into experimental and control groups was strictly maintained using a computer-generated random allocation method (randomizer.org), thereby upholding the integrity of the *Randomized Controlled Trial* (RCT) design.

This hybrid approach allowed for a targeted yet controlled investigation of the effects of *Trimūrti Dhyāna* in a physiologically homogeneous sample. The gender-homogeneous sampling helped control for sex-based autonomic variability known to affect HRV metrics. All participants provided informed consent and were assured access to the intervention post-study, if allocated to the control group.

2.3 Ethical Approval and Consent

Ethical clearance was obtained from the Central Ethical Committee of SDUAHER (Ref. SDUAHER/KLR/CEC/69/2021–22), and the trial was registered under the Clinical Trial Registry of India (CTRI/REF/2022/07/056073). Written informed consent was obtained from all participants in accordance with the Declaration of Helsinki.

2.4 Randomization and Group Allocation

After screening and baseline assessments, participants were randomly assigned to one of the two groups using a computer-generated random sequence via Randomizer.org. Allocation concealment was maintained prior to assignment to ensure methodological rigor. The two groups were defined as follows:

Experimental Group (DG). Participants received a six-week *Trimūrti Dhyāna* intervention.

Control Group (CG). Participants continued their usual daily activities without any structured meditation or physical exercise intervention.

To maintain uniformity, all intervention sessions were conducted in a fixed time slot (4:10 PM to 4:30 PM), five days a week, in a quiet, designated room. A trained Yoga researcher provided live verbal guidance throughout each session, ensuring procedural consistency across participants. The control group was instructed to refrain from initiating any new wellness or mindfulness practices during the intervention phase.

2.5 Participant Adherence and Engagement

To monitor participant adherence, attendance was recorded for each session, and participants were encouraged to maintain a personal logbook documenting their reflections and perceived experiences. The overall attendance rate was above 85%, reflecting high compliance with the protocol.

Weekly informal check-ins were held to address participant concerns and to motivate continued engagement. Anecdotal feedback from participants included experiences of mental clarity, emotional balance, and a deeper sense of inner calm. Such subjective accounts suggest that the *Trimūrti Dhyāna* sessions were not only well-received but also experientially enriching for most participants.

2.6 Outcome Measures

All assessments were conducted at baseline (pre-intervention) and after six weeks (post-intervention) under controlled laboratory conditions between 9:00 AM and 11:00 AM. Participants were advised to abstain from caffeine, alcohol, and vigorous activity for 24 hours prior to testing.

2.6.1 Heart Rate Variability (HRV)

Heart Rate Variability (HRV) was assessed using a 4-channel PowerLab 15 T system (AD Instruments, Australia), with ECG recordings acquired over a 15-minute period in a quiet, temperature-controlled environment (22–26 °C). Participants were instructed to lie in a supine position, keeping their eyes closed in a relaxed yet wakeful state, without voluntarily controlling their breathing pattern, in accordance with standardized HRV recording protocols (Task Force 1996, 1043–1065). The recorded ECG signals were processed and analyzed using LabChart 7 software along with the MLS310 HRV analysis module. Fast Fourier Transform (FFT) was applied to extract both time-domain and frequency-domain HRV parameters.

The key time-domain indices included the Standard Deviation of RR intervals (SDRR) and Root Mean Square of Successive Differences (RMSSD). Frequency-domain indices comprised Total Power (TP), Low-Frequency Power (LF, 0.04–0.15 Hz), High-Frequency Power (HF, 0.15–0.4 Hz), and the LF/HF ratio, all computed in both milliseconds squared (ms^2) and normalized units. Five-minute stationary ECG epochs free from ectopic beats and movement artifacts were manually selected for final analysis.

2.6.2 Psychological Assessment of Triguna

To assess the psychological dimensions of *Triguṇa – Sattva*, *Rajas*, and *Tamas* – this study employed the *Vedic Personality Inventory* (VPI), a standardized self-report instrument developed by David B. Wolf (1999) in alignment with the philosophical frameworks of the *Bhagavad Gītā* and *Sāṃkhya* philosophy. The inventory comprises 56 items rated on a 7-point Likert scale 1 strongly disagree, 7 strongly agree and yields independent scores for each *Guṇa*.

The VPI has demonstrated strong psychometric properties, including high internal consistency with Cronbach's alpha coefficients of 0.83 (*Sattva*), 0.84 (*Rajas*), and 0.72 (*Tamas*) in Indian populations. Its construct validity and cross-cultural reliability have also been supported in subsequent yoga, spirituality, and psychological research.

Scoring: Each *Guṇa* is assessed through a subset of items – 15 for *Sattva*, 19 for *Rajas*, and 22 for *Tamas*. The average score for each *Guṇa* is calculated by taking the mean of the item scores corresponding to that *Guṇa*. Thus, a higher mean score reflects the greater predominance of that particular *Guṇa* in an individual's personality profile (David B. Wolf 1999, 1379–1390).

In the present study, the VPI was administered at both baseline and post-intervention to evaluate potential changes in the participants' dominant *Guṇas* as a result of the six-week *Trimūrti Dhyāna* practice.

2.7 Statistical Analysis

Prior to conducting inferential statistics, all quantitative variables were assessed for normality using the *Shapiro-Wilk Test*, supplemented by visual inspections of histograms and Q-Q plots. Variables that followed a normal distribution (ND) were analyzed using parametric tests – *Paired Sample T-Test* for within-group (pre-post) comparisons and *Independent Sample T-Test* for between-group comparisons. Non-normally distributed variables (NND) were analyzed using non-parametric alternatives – *Wilcoxon Signed Rank Test* for within-group comparisons and *Mann-Whitney U Test* for between-group comparisons. Homogeneity of variances between the experimental and control groups was evaluated using *Levene's Test* wherever applicable. Based on this assessment, HRV parameters were predominantly analyzed using non-parametric tests due to deviation from normality, whereas *Vedic Personality Inventory* (VPI) scores were analyzed using parametric methods due to their normal distribution. Descriptive statistics were reported as mean ± standard deviation (SD). In addition to statistical significance (p-values), effect sizes (Cohen's d) and percentage change were reported to provide a comprehensive understanding of the magnitude and direction of change. All analyses were performed using SPSS version 20.0 (IBM), and a p-value of less than 0.05 was considered statistically significant.

3 Results

The *Dhyāna Group* (DG) and *Control Group* (CG) had essentially equal sociodemographic and medical characteristics. The initial values of all variables were normally distributed and did not significantly differ across groups ($p > 0.05$). Thirty male students were involved in the study. The mean age of participants in the DG was 24.64 ± 3.97 years, whereas the average age of participants in the CG was 23.13 ± 2.99 years (Table 1).

3.1 Heart Rate Variability

In this study, both time-domain (e.g., RMSSD, SDRR) and frequency-domain parameters (e.g., LF, HF, LF/HF ratio) were measured pre- and post-intervention using a 5-minute resting ECG-based assessment. These indices help assess subtle shifts in autonomic tone that may occur following meditative practice such as *Trimūrti Dhyāna*.

Table 1
Comparison of Socio-Demographic and Clinical Variables

Variables	DG	CG
Number of Participants (only male)	15	15
Mean Age (years ± SD)	24.64 ± 3.97	23.13 ± 2.99

* DG = Dhyāna Group; CG = Control Group.

Table 2
Comparison between Dhyāna Group Pre-Post HRV

Variable	Pre & Post	Mean ± SD	% Change	ES	*p*-value
AHRBPM	Pre	78.60 ± 10.07	-3.39	0.27	0.532
	Post	75.93 ± 9.03			
SDRR	Pre	43.34 ± 17.44	15.57	0.43	0.112
	Post	50.09 ± 12.98			
CVRR	Pre	0.05 ± 0.02	20	0.63	0.069
	Post	0.06 ± 0.01			
SDSD	Pre	29.71 ± 12.36	29.7	0.49	0.427
	Post	38.54 ± 21.90			
RMSSD	Pre	29.67 ± 12.34	29.76	0.49	0.427
	Post	38.50 ± 21.88			
Prrx	Pre	10.68 ± 10.09	41.8	0.31	0.91
	Post	15.14 ± 17.00			
TP	Pre	1749.25 ± 1020.93	24.86	0.32	0.609
	Post	2184.07 ± 1572.22			
LF Power ms^2	Pre	702.16 ± 325.42	-6.91	0.12	0.307
	Post	653.66 ± 433.29			
LF Power	Pre	43.91 ± 10.55	-29.15	1.4	.004**
	Post	31.11 ± 7.41			
LF Power nu	Pre	67.62 ± 10.71	-16	0.72	0.211
	Post	56.81 ± 18.06			
HF Power ms^2	Pre	353.56 ± 192.84	72.6	0.51	0.776
	Post	610.13 ± 675.74			
HF Power	Pre	20.46 ± 7.70	28.5	0.43	0.82
	Post	26.29 ± 17.37			
HF Power nu	Pre	31.62 ± 10.64	31.7	0.71	0.256
	Post	41.64 ± 16.85			
LF/HF	Pre	2.57 ± 1.48	-32.3	0.64	0.233
	Post	1.74 ± 1.08			
SSS	Pre	38.85 ± 5.03	19.02	1.44	.000**
	Post	46.24 ± 5.23			
SRS	Pre	32.85 ± 2.89	-12.57	1.36	.000**
	Post	28.72 ± 3.15			
STS	Pre	28.28 ± 5.70	-11.5	0.63	.004**
	Post	25.03 ± 4.48			

* AHRBPM = Average Heart Rate Beat Per Minute; SDRR = Standard Deviation R-R Intervals; CVRR = Coefficient of Variance of RR Intervals; SDSD = Standard Deviation of Successive Differences; RMSSD = Root Mean Square of Successive Differences; TP = Total Power; LF = Low-Frequency; HF = High Frequency; SSS = Standard Sattva Score; SRS = Standard Rajas Score; STS = Standard; Tamas Score = Highly Significant ($p<0.001$) **

Table 3
Comparison between Control Group Pre-Post HRV

Variables	Pre & Post	Mean ± SD	% Change	ES	*p*-value
AHRBPM	Pre	75.23 ± 11.40	3.69	0.24	0.156
	Post	78.01 ± 10.96			
SDRR	Pre	54.92 ± 22.02	5.03	0.11	0.865
	Post	57.68 ± 24.76			
CVRR	Pre	0.06 ± 0.02	16.67	0.5	0.14
	Post	0.07 ± 0.02			
SDSD	Pre	45.65 ± 31.36	1	0.01	0.955
	Post	46.11 ± 32.14			
RMSSD	Pre	45.59 ± 31.31	1.03	0.01	0.955
	Post	46.06 ± 32.10			
Prrx	Pre	21.65 ± 23.00	0.83	0	0.955
	Post	21.83 ± 22.80			
TP	Pre	3649.01 ± 3800.81	5.24	0.05	0.865
	Post	3840.05 ± 3452.98			
LF Power ms^2	Pre	1099.50 ± 789.87	17.68	0.16	1
	Post	1293.89 ± 1470.95			
LF Power	Pre	36.24 ± 11.28	1.24	0.03	0.865
	Post	36.69 ± 14.85			
LF Power nu	Pre	56.50 ± 19.23	0.12	0	0.82
	Post	56.62 ± 19.75			
HF Power ms^2	Pre	1248.93 ± 1471.73	10.08	0.07	0.955
	Post	1374.81 ± 1820.06			
HF Power	Pre	30.08 ± 17.54	-5.85	0.11	0.733
	Post	28.32 ± 13.84			
HF Power nu	Pre	43.13 ± 18.28	-0.2	0	0.91
	Post	43.04 ± 18.09			
LF/HF	Pre	1.90 ± 1.73	-4.74	0.05	0.82
	Post	1.81 ± 1.46			
SSS	Pre	39.64 ± 7.48	-1.08	0.05	0.794
	Post	39.21 ± 6.99			
SRS	Pre	32.21 ± 3.27	3.69	0.34	0.076
	Post	33.40 ± 3.71			
STS	Pre	28.14 ± 5.41	-2.7	0.14	0.538
	Post	27.38 ± 4.73			

* AHRBPM = Average Heart Rate Beat Per Minute; SDRR = Standard Deviation R-R Intervals; CVRR = Coefficient of Variance of RR Intervals; SDSD = Standard Deviation of Successive Differences; RMSSD = Root Mean Square of Successive Differences; TP = Total Power; LF = Low-Frequency; HF = High Frequency; SSS = Standard Sattva Score; SRS = Standard Rajas Score; STS = Standard; Tamas Score = Highly Significant ($p<0.001$) **

Table 4
Comparison between Groups DG and CG

Variables	Groups	Post HRV Mean ± SD	*p*-value
AHRBPM	DG	75.93 ± 9.03	0.724
	CG	78.01 ± 10.96	
SDRR	DG	50.09 ± 12.98	0.494
	CG	57.68 ± 24.76	
CVRR	DG	0.06 ± 0.01	0.485
	CG	0.07 ± 0.02	
SDSD	DG	38.54 ± 21.90	0.633
	CG	46.11 ± 32.14	
RMSSD	DG	38.50 ± 21.88	0.633
	CG	46.06 ± 32.10	
Prrx	DG	15.14 ± 17.00	0.694
	CG	21.83 ± 22.80	
TP	DG	2184.07 ± 1572.22	0.152
	CG	3840.05 ± 3452.98	
LF Power ms^2	DG	653.66 ± 433.29	0.078
	CG	1293.89 ± 1470.95	
LF Power	DG	31.11 ± 7.41	0.254
	CG	36.69 ± 14.85	
LF Power nu	DG	56.81 ± 18.06	0.852
	CG	56.62 ± 19.75	
HF Power ms^2	DG	610.13 ± 675.74	0.178
	CG	1374.81 ± 1820.06	
HF Power	DG	26.29 ± 17.37	0.419
	CG	28.32 ± 13.84	
HF Power nu	DG	41.64 ± 16.85	0.756
	CG	43.04 ± 18.09	
LF/HF	DG	1.74 ± 1.08	0.787
	CG	1.81 ± 1.46	
SSS	DG	46.24 ± 5.23	.004**
	CG	39.21 ± 6.99	
SRS	DG	28.72 ± 3.15	.001**
	CG	33.40 ± 3.71	
STS	DG	25.03 ± 4.48	0.174
	CG	27.38 ± 4.73	

* AHRBPM = Average Heart Rate Beat Per Minute; SDRR = Standard Deviation R-R Intervals; CVRR = Coefficient of Variance of RR Intervals; SDSD = Standard Deviation of Successive Differences; RMSSD = Root Mean Square of Successive Differences; TP = Total Power; LF = Low-Frequency; HF = High Frequency; SSS = Standard Sattva Score; SRS = Standard Rajas Score; STS = Standard; Tamas Score = Highly Significant ($p<0.001$) **

3.1.1 Effect of Trimūrti Dhyāna on Average Heart Rate Beat Per Minutes (AHRBPM)

The post-intervention analysis showed a slight reduction in AHRBPM from 78.60 ± 10.07 to 75.93 ± 9.03; however, this change was statistically insignificant (p = 0.532), indicating that the observed decrease may not be attributed to the intervention with confidence. The effect size was small (Cohen's d = 0.27), with a 3.39% decrease in AHRBPM (Table 2).

In the *Control Group* (CG), post-intervention analysis showed a slight increase in AHRBPM from 75.23 ± 11.40 to 78.01 ± 10.96, which was also not statistically significant (p = 0.156). The effect size was small (Cohen's d = 0.24), with a 3.69% increase in AHRBPM (Table 3). Between-group (DG vs CG) comparison showed no statistically significant difference in AHRBPM at post-intervention (75.93 ± 9.03 vs 78.01 ± 10.96; p = 0.724). Although the percentage change and effect size were numerically greater in the DG compared to the CG, the difference was not statistically significant (Table 4).

3.1.2 Effect of Trimūrti Dhyāna on Standard Deviation R-R intervals (SDRR)

Post-intervention analysis in the *Dhyāna Group* (DG) showed an increase in the mean ± SD of Standard Deviation of R-R Intervals (SDRR) from 43.34 ± 17.44 to 50.09 ± 12.98. However, this increase was not statistically significant (p = 0.112), suggesting a possible trend but lacking conclusive evidence. The effect size was moderate (Cohen's d = 0.43), with a 15.57% increase in SDRR (Table 2). In the *Control Group* (CG), SDRR increased slightly from 54.92 ± 22.02 to 57.68 ± 24.76, but this difference was statistically non-significant (p = 0.865), indicating a negligible change. The effect size was small (Cohen's d = 0.11), with a 5.03% increase in SDRR (Table 3).

Between-group comparison at post-intervention showed no statistically significant difference in SDRR between DG and CG (50.09 ± 12.98 vs 57.68 ± 24.76; p = 0.494). Despite the lack of statistical significance, the percentage change and effect size were greater in the DG compared to the CG, indicating a potentially meaningful trend favoring the intervention (Table 4).

3.1.3 Effect of Trimūrti Dhyāna on Coefficient of Variance of RR intervals (CVRR)

Post-intervention analysis in the *Dhyāna Group* (DG) showed an increase in the mean ± SD of Coefficient of Variance of RR intervals (CVRR) from 0.05 ± 0.02 to 0.06 ± 0.01. Although this change approached statistical significance (p = 0.069), it did not reach the conventional threshold (p < 0.05), suggesting a trend-level improvement in CVRR due to the intervention. The effect size was moderate (Cohen's d = 0.63), with a 20% increase in CVRR (Table 2). In the *Control Group* (CG), CVRR increased from 0.06 ± 0.02 to 0.07 ± 0.02, which was not statistically significant (p = 0.140), indicating a modest and non-conclusive change. The effect size was moderate (Cohen's d = 0.50), with a 16.67% increase in CVRR (Table 3). Between-group post-intervention comparison revealed no statistically significant difference in CVRR between DG and CG (0.06 ± 0.01 vs 0.07 ± 0.02; p = 0.485). However, the percentage change and effect size were slightly higher in the DG compared to the CG, indicating a more favorable trend in the intervention group (Table 4).

3.1.4 Effect of Trimūrti Dhyāna on Standard Deviation of Successive Differences (SDSD)

Post-intervention analysis in the *Dhyāna Group* (DG) showed an increase in the mean ± SD of Standard Deviation of Successive Differences (SDSD) from 29.71 ± 12.36 to 38.54 ± 21.90. However, this change was not statistically significant (p = 0.427), suggesting a trend but not conclusive evidence of improvement. The effect size was moderate (Cohen's d = 0.49), with a 29.7% increase in SDSD (Table 2). In the *Control Group* (CG), SDSD increased slightly from 45.65 ± 31.36 to 46.11 ± 32.14, which was also not statistically significant (p = 0.955), indicating a negligible change. The effect size was negligible (Cohen's d = 0.01), with only a 1.00% increase in SDSD (Table 3). Between-group comparison post-intervention revealed no statistically significant difference in SDSD between DG and CG (38.54 ± 21.90 vs 46.11 ± 32.14; p = 0.633). Nevertheless, the percentage increase and effect size were notably higher in the DG compared to the CG, indicating a trend that favors the intervention group (Table 4).

3.1.5 Effect of Trimūrti Dhyāna on Root Mean Square of Successive Differences (RMSSD)

DG (pre-post) comparison: Post-intervention analysis showed an increase in the mean ± SD Root Mean Square of Successive Differences (RMSSD) from 29.67 ± 12.34 to 38.50 ± 21.88; however, this increase was not statistically significant (p = 0.427). The effect size was moderate (Cohen's d = 0.49), with a 29.76% increase in RMSSD (Table 2). CG (pre-post) comparison: Post-intervention analysis showed a minimal increase in RMSSD from 45.59 ± 31.31 to 46.06 ± 32.10; this difference was statistically non-significant (p = 0.955). The effect size was negligible (Cohen's d = 0.01), with a 1.03% increase in RMSSD (Table 3). Between-group (DG vs CG) comparison: Post-intervention analysis between the DG and CG (38.50 ± 21.88 vs 46.06 ± 32.10) showed no statistically significant difference in RMSSD between the groups (p = 0.633). However, the percentage change and effect size were larger in the DG compared to the CG, indicating a potential trend that may be more evident in larger samples (Table 4).

3.1.6 Effect of Trimūrti Dhyāna on Parasympathetic Reactivity Response Index (PRRx)

Post-intervention analysis in the *Dhyāna Group* (DG) showed an increase in the mean ± SD of Parasympathetic Reactivity Response Index (PRRx) from 10.68 ± 10.09 to 15.14 ± 17. 00. However, this change was not statistically significant (p = 0.910), suggesting that the increase may be due to chance rather than the intervention effect. The effect size was small (Cohen's d = 0.31), with a 41.8% increase in PRRx (Table 2). In the *Control Group* (CG), PRRx increased marginally from 21.65 ± 23.00 to 21.83 ± 22.80, which was also statistically non-significant (p = 0.955), indicating no meaningful change. The effect size was negligible (Cohen's d = 0.00), with only a 0.83% increase in PRRx (Table 3). Between-group comparison at post-intervention showed no statistically significant difference in PRRx between DG and CG (15.14 ± 17.00 vs 21.83 ± 22.80; p = 0.694). Despite the non-significant difference, the percentage change and effect size were greater in the DG compared to the CG, indicating a modest trend favoring the intervention (Table 4).

3.1.7 Effect of Trimūrti Dhyāna on Total Power (TP)

Post-intervention analysis in the *Dhyāna Group* (DG) showed an increase in the mean ± SD of Total Power (TP) from 1749.25 ± 1020.93 to 2184.07 ± 1572. 22. However, this change was not statistically significant (p = 0.609), indicating that the increase in TP may have occurred by chance rather than due to the intervention. The effect size was small (Cohen's d = 0.32), with a 24.86% increase in TP (Table 2). In the *Control Group* (CG), TP increased slightly from 3649.01 ± 3800.81 to 3840.05 ± 3452. 98. This increase was also not statistically significant (p = 0.865), suggesting negligible change in the absence of intervention. The effect size was negligible (Cohen's d = 0.05), with only a 5.24% increase in TP (Table 3). Between-group comparison at post-intervention showed no statistically significant difference in TP between DG and CG (2184.07 ± 1572.22 vs 3840.05 ± 3452.98; p = 0.152). Despite the lack of statistical significance, the percentage increase and effect size were greater in the DG compared to the CG, indicating a potential trend in favor of the intervention (Table 4).

3.1.8 Effect of Trimūrti Dhyāna on Low Frequency (ms^2)

Post-intervention analysis in the *Dhyāna Group* (DG) showed a slight decrease in the mean ± SD of Low Frequency (LF) power from 702.16 ± 325.42 to 653.66 ± 433. 29. However, this decrease was not statistically significant (p = 0.307), indicating the change may not be attributed to the intervention with confidence. The effect size was small (Cohen's d = 0.12), with a −6.91% reduction in LF power (Table 2). In the *Control Group* (CG), LF power increased from 1099.50 ± 789.87 to 1293.89 ± 1470.95. This increase was statistically non-significant (p = 1.000), suggesting negligible impact without the intervention. The effect size was small (Cohen's d = 0.16), with a 17.68% increase in LF power (Table 3). Between-group comparison post-intervention revealed no statistically significant difference in LF power between DG and CG (653.66 ± 433.29 vs 1293.89 ± 1470.95; p = 0.078). Nonetheless, the percentage change and effect size favored the CG over the DG, though not significantly (Table 4).

3.1.9 Effect of Trimūrti Dhyāna on Low-Frequency Power (LF Power)

Post-intervention analysis in the *Dhyāna Group* (DG) showed a significant reduction in the mean ± SD of Low Frequency (LF) power (normalized units) from 43.91 ± 10.55 to 31.11 ± 7.41. This decrease was statistically significant (p = 0.004), indicating that the reduction in LF power may be confidently attributed to the *Trimūrti Dhyāna* intervention. The effect size was large (Cohen's d = 1.40), with a 29.15% decrease in LF power (Table 2). In the *Control Group* (CG), LF power increased slightly from 36.24 ± 11.28 to 36.69 ± 14.85, which was not statistically significant (p = 0.865), suggesting no meaningful change without intervention. The effect size was negligible (Cohen's d = 0.03), with only a 1.24% increase in LF power (Table 3). Between-group comparison post-intervention showed no statistically significant difference in LF power between DG and CG (31.11 ± 7.41 vs 36.69 ± 14.85; p = 0.254). However, the within-group reduction and effect size were substantially greater in the DG, suggesting a potentially meaningful parasympathetic shift (Table 4).

3.1.10 Effect of Trimūrti Dhyāna on Low Frequency (nu)

Post-intervention analysis in the *Dhyāna Group* (DG) showed a decrease in the mean ± SD of Low Frequency (LF) power (normalized units) from 67.62 ± 10.71 to 56.81 ± 18.06. Although this reduction suggests a potential parasympathetic shift, it was not statistically significant (p = 0.211). The effect size was moderate (Cohen's d = 0.72), with a 16% decrease in LF power (nu) (Table 2). In the *Control Group* (CG), LF power (nu) remained nearly unchanged from 56.50 ± 19.23 to 56.62 ± 19. 75. This difference was statistically non-significant (p = 0.820), indicating stability in autonomic balance without intervention. The effect size was negligible (Cohen's d = 0.00), with only a 0.12% increase in LF power (Table 3). Between-group comparison post-intervention revealed no statistically significant difference between DG and CG in LF power (56.81 ± 18.06 vs 56.62 ± 19.75; p = 0.852). Nonetheless, the *Dhyāna Group* exhibited a larger percentage change and effect size, suggesting a trend toward autonomic modulation that may warrant further investigation (Table 4).

3.1.11 Effect of Trimūrti Dhyāna on HF Power (ms2)

Post-intervention analysis in the *Dhyāna Group* (DG) revealed an increase in the mean ± SD of High-Frequency (HF) power from 353.56 ± 192.84 to 610.13 ± 675.74. Although this change reflects a 72.6% increase in parasympathetic activity, it was not statistically significant (p = 0.776), suggesting that the observed improvement may be due to random variation. The effect size was moderate (Cohen's d = 0.51), indicating a potentially meaningful effect (Table 2). In the *Control Group* (CG), HF power showed a minimal rise from 1248.93 ± 1471.73 to 1374.81 ± 1820.06. This change was also statistically non-significant (p = 0.955), and the effect size was very small (Cohen's d = 0.07), with only a 10.08% increase (Table 3). Between-group comparison post-intervention indicated no statistically significant difference between DG and CG in HF power (610.13 ± 675.74 vs 1374.81 ± 1820.06; p = 0.178). However, the *Dhyāna Group* showed a comparatively larger effect size and percentage change, indicating a trend toward enhanced parasympathetic activation (Table 4).

3.1.12 Effect of Trimūrti Dhyāna on High-Frequency Power (HF Power)

Post-intervention analysis in the *Dhyāna Group* (DG) showed an increase in the mean ± SD of High-Frequency (HF) power (normalized units) from 20.46 ± 7.70 to 26.29 ± 17. 37. Although this reflects a 28.5% improvement in parasympathetic modulation, the change was not statistically significant (p = 0.820), suggesting the possibility of random variation. The effect size was moderate (Cohen's d = 0.43), indicating a potentially meaningful, though inconclusive, trend (Table 2). In the *Control Group* (CG), HF power slightly decreased from 30.08 ± 17.54 to 28.32 ± 13. 84. This decrease was also statistically non-significant (p = 0.733), with a small effect size (Cohen's d = 0.11) and a −5.85% change (Table 3). Between-group comparison post-intervention revealed no statistically significant difference in HF power between DG and CG (26.29 ± 17.37 vs 28.32 ± 13.84; p = 0.419). However, the percentage change and effect size were relatively higher in the *Dhyāna Group*, suggesting a directionally positive impact of the intervention (Table 4).

3.1.13 Effect of Trimūrti Dhyāna on HF Power (nu)

Post-intervention analysis in the *Dhyāna Group* (DG) revealed an increase in mean ± SD of High-Frequency Power (HF Power) in normalized units (nu) from 31.62 ± 10.64 to 41.64 ± 16.85. Although this represents a 31.7% rise in parasympathetic nervous system activity, the change was not statistically significant ($p = 0.256$), indicating that the increase may not be confidently attributed to the intervention. The effect size was moderate to large (Cohen's $d = 0.71$), suggesting a potentially meaningful impact (Table 2). In the *Control Group* (CG), HF Power (nu) remained almost unchanged, showing a slight decrease from 43.13 ± 18.28 to 43.04 ± 18.09. This change was statistically insignificant ($p = 0.910$), with a negligible effect size (Cohen's $d = 0.00$) and a −0.20% change (Table 3). Between-group comparison post-intervention indicated no statistically significant difference in HF Power (nu) between DG and CG (41.64 ± 16.85 vs 43.04 ± 18.09; $p = 0.756$). Nonetheless, the *Dhyāna Group* demonstrated a higher effect size and percentage change compared to the *Control Group*, hinting at a potentially positive influence of the intervention (Table 4).

3.1.14 Effect of Trimūrti Dhyāna on LF/HF Ratio

Post-intervention analysis in the *Dhyāna Group* (DG) showed a reduction in the mean ± SD of Low Frequency to High Frequency (LF/HF) Ratio from 2.57 ± 1.48 to 1.74 ± 1.08. This represents a 32.3% decrease in sympathovagal balance in favor of parasympathetic dominance. However, this change was not statistically significant ($p = 0.233$), implying that the reduction may have occurred by chance. The effect size was moderate (Cohen's $d = 0.64$), indicating a potentially clinically relevant shift (Table 2). In the *Control Group* (CG), the LF/HF Ratio decreased slightly from 1.90 ± 1.73 to 1.81 ± 1.46. This change was also statistically insignificant ($p = 0.820$), with a negligible effect size (Cohen's $d = 0.05$) and a −4.74% change (Table 3). Between-group comparison post-intervention revealed no statistically significant difference in LF/HF Ratio between DG and CG (1.74 ± 1.08 vs 1.81 ± 1.46; $p = 0.787$). Nonetheless, the *Dhyāna Group* exhibited a substantially greater percentage reduction and effect size than the *Control Group*, suggesting a possible beneficial impact of the *Trimūrti Dhyāna* practice (Table 4).

3.2 Three Gunas Changes

In the experimental group, a statistically significant increase was observed in *Sattva* scores ($p < 0.05$), while Rajas and Tamas scores decreased compared to the control group. The mean *Sattva* score improved from 132.4 to 148.7 after the 6-week *Trimūrti Dhyāna* practice. These changes suggest a psychological shift towards balanced and *sattvic* personality traits.

3.2.1 Effect of Trimūrti Dhyāna on Standard Sattva Score (SSS)

Post-intervention analysis in the *Dhyāna Group* (DG) showed a highly significant increase in the mean ± SD of *Standard Sattva Score* (SSS) from 38.85 ± 5.03 to 46.24 ± 5.23 ($p < 0.001$). This represents a 19.02% enhancement in the *Sattva* quality following the *Trimūrti Dhyāna* intervention. The effect size was large (Cohen's $d = 1.44$), indicating a substantial psychological and emotional improvement (Table 2). In the *Control Group* (CG), the *Sattva* score decreased slightly from 39.64 ± 7.48 to 39.21 ± 6.99, which was not statistically significant ($p = 0.794$). The effect size was negligible (Cohen's $d = 0.05$), with a −1.08% change in SSS (Table 3). A between-group post-intervention comparison showed a highly significant difference in Sattva scores (DG vs CG: 46.24 ± 5.23 vs 39.21 ± 6.99; $p < 0.001$), supporting the conclusion that the *Trimūrti Dhyāna* intervention had a strong positive effect on cultivating *Sattva Guṇa*. The percentage change and effect size were markedly higher in the *Dhyāna Group* compared to the *Control Group* (Table 4).

3.2.2 Effect of Trimūrti Dhyāna on Standard Rajas Score (SRS)

Post-intervention analysis in the *Dhyāna Group* (DG) revealed a highly significant decrease in the mean ± SD of *Standard Rajas Score* (SRS), from 32.85 ± 2.89 to 28.72 ± 3.15 ($p < 0.001$). This reflects a 12.57% reduction in *Rajas*, indicating a shift away from restlessness, impulsivity, and overactivity, typically associated with *Rajo Guṇa*. The effect size was large (Cohen's $d = 1.36$), suggesting a strong intervention effect (Table 2). In contrast, the *Control Group* (CG) showed a slight increase in SRS from 32.21 ± 3.27 to 33.40 ± 3.71; however, this change was not statistically significant ($p = 0.076$). The effect size was small (Cohen's $d = 0.34$), with a 3.69% increase in *Rajas* characteristics (Table 3). Between-group comparison following the intervention demonstrated a highly significant difference between DG and CG (28.72 ± 3.15 vs 33.40 ± 3.71; $p < 0.001$). The percentage change and effect size were substantially more favorable in the *Dhyāna Group*, highlighting the efficacy of *Trimūrti Dhyāna* in reducing *Rajo Guṇa*-related psychological tendencies (Table 4).

3.2.3 Effect on Trimūrti Dhyāna on Standard Tamas Score (STS)

Post-intervention analysis in the *Dhyāna Group* (DG) showed a highly significant decrease in the mean ± SD of *Standard Tamas Score* (STS), from 28.28 ± 5.70 to 25.03 ± 4.48 ($p < 0.001$). This corresponds to an 11.5% reduction in *Tamas* traits, reflecting improvements in clarity, motivation, and alertness among participants. The effect size was moderate (Cohen's $d = 0.63$), indicating a meaningful change in *Tamas*-related psychological patterns (Table 2). In the *Control Group* (CG), STS decreased marginally from 28.14 ± 5.41 to 27.38 ± 4.73; however, this change was not statistically significant ($p = 0.538$). The effect size was small (Cohen's $d = 0.14$), with a 2.7% decrease in *Tamas* (Table 3). Between-group comparison after the intervention showed a non-significant difference between DG and CG (25.03 ± 4.48 vs 27.38 ± 4.73; $p = 0.174$). Nevertheless, the direction and magnitude of change—both in terms of percentage and effect size – were more favourable in the *Dhyāna Group*, suggesting potential benefits of *Trimūrti Dhyāna* in reducing inertia, dullness, and *tamasic* tendencies (Table 4).

4 Discussion

The current study contributes to the emerging body of scientific literature on *Upaniṣadic* meditation techniques by empirically testing the effects of *Trimūrti Dhyāna*, a visualization-based meditative practice rooted in *Dhyānabindu Upaniṣad*. Unlike prior theoretical works that explored the symbolic and philosophical dimensions of the *Trimūrti* – such as Bailey's (2014, 1622) exposition of *Śiva*, Leeming's (2020) discussion on *Viṣṇu*, Markel's (2024, 43) cosmological analysis, and Deussen's (2010) foundational work on *Upaniṣadic* thought – this study employed a randomized design and psychometrically validated instruments to assess both physiological (HRV) and psychological (*triguṇa*) outcomes.

The results demonstrated a significant increase in *Sattva* and corresponding declines in *Rajas* and *Tamas*, indicating a shift toward greater psychological clarity, self-regulation, and equilibrium. These findings align with yogic texts which consider *Sattva* as the *Guṇa* of inner harmony and spiritual insight (Das 1991, 55; White 2012, 25). The meditative structure of *Trimūrti Dhyāna* – invoking *Brahmā*, *Viṣṇu*, and *Śiva* through mantra and visualization – likely contributes to this shift, as also described in classical sources (Flood 1996, 58–63; Grimes 1995, 11–12).

The use of the Vedic Personality Inventory (VPI), which has well-established reliability and construct validity (Wolf 1999, 1379–1390), provided a robust framework to measure these changes. Previous studies, such as Dasa (1999), have also observed similar shifts in *Guṇa* profiles following mantra meditation, thereby reinforcing the psychological validity of these results.

While several HRV indices such as RMSSD, SDRR, and HF Power showed positive trends, most changes were statistically non-significant. Notably, LF Power decreased significantly ($p = 0.004$), suggesting a reduction in sympathetic arousal and potential improvement in parasympathetic tone. These trends are consistent with studies that link meditation with enhanced vagal regulation and stress resilience (Lehrer and Gevirtz 2014, 756; Bin Waleed *et al.* 2022).

Although some HRV results did not achieve significance, factors such as small sample size, inter-individual variation, and limited duration likely influenced these outcomes. Future studies with larger cohorts, rigorous control of confounders, and longer-term follow-up may help substantiate these physiological trends.

4.1 Limitations and Future Implications

While this pilot study provides encouraging preliminary evidence for the psychological and autonomic effects of *Trimūrti Dhyāna*, several methodological limitations warrant consideration. The small sample size (N = 30) and six-week duration may have restricted the study's statistical power to detect subtle HRV changes. Additionally, although randomization was performed, the sample consisted exclusively of healthy male students from a single academic institution. This homogeneity helped control gender-related variability in HRV and *Guṇa* traits but limits generalizability across genders and broader demographics.

Further, lifestyle-related confounders such as diet, sleep quality, and emotional fluctuations were not strictly controlled, which could have impacted HRV independently of the intervention. The reliance on self-report tools like the VPI may also introduce subjectivity or social desirability bias.

Future research should aim to include larger, more diverse, and gender-balanced samples, longer intervention durations, and greater methodological rigor – including the use of objective neurophysiological measures like EEG or salivary cortisol. Such enhancements can deepen the understanding of how *Upaniṣadic* practices like *Trimūrti Dhyāna* contribute to psychospiritual well-being in contemporary contexts.

5 Conclusions

This pilot investigation assessed the psychophysiological and psychological effects of *Trimūrti Dhyāna;* a meditative visualization technique grounded in the *Dhyānabindu Upaniṣad*. The findings indicate that consistent practice leads to a statistically significant elevation in *Sattva*, along with reductions in *Rajas and Tamas*, suggesting inner balance and self-regulation.

Although most HRV parameters did not show statistically significant changes, positive physiological shifts – such as increased RMSSD, SDRR, HF Power, and significantly reduced LF Power – indicate potential autonomic benefits. The observed decline in LF/HF ratio suggests a movement toward parasympathetic dominance and improved autonomic stability.

By bridging ancient contemplative methods with modern physiological metrics, this study highlights the relevance of *Trimūrti Dhyāna* as a psychospiritual wellness tool. It offers a non-pharmacological, accessible, and culturally rooted intervention with potential for emotional resilience and inner clarity.

Future studies involving more diverse participants, extended intervention periods, and enhanced methodological rigor will be essential to confirm and expand upon these promising initial findings.

References

Bailey, Lloyd W. 2014. "Śiva." In *Encyclopedia of Psychology and Religion*, edited by David A. Leeming, 1620–1623. Boston, MA: Springer. doi.org.

Basavaraddi, Ishwar V. n.d. *Yoga: Its Origin, History and Development*. Ministry of AYUSH, Government of India. Accessed December 21, 2022. yoga.ayush.gov.in

Bin Waleed, Khalid, Ijaz Lakhani, Ming Gong, Tao Liu, Luis Roever, Kenneth C. Li, Rajiv Rajan, M. Qaisar Ibrahimi, Yuan Xia, Gary Tse, David Chang, and Shirley Lee. 2022. "Heart Rate Variability and Meditation: A Meta-analysis." *EP Europace* 24: euac053.053. doi.org.

Das, Ranjan C. 1991. "Standardization of the Gītā Inventory of Personality." *Journal of Indian Psychology* 9: 47–54.

Dasa, Dasaratha. 1999. "Effects of the Hare Krishna Maha Mantra on Stress, Depression and the Three Guṇas." *Vaishnava News Network*. Accessed December 21, 2022. vnn.org.

Deussen, Paul. 1997. *Sixty Upaniṣads of the Veda*. Translated by V. M. Bedekar and G. B. Palsule. Delhi, IND: Motilal Banarsidass.

Deussen, Paul. 2010. *The Philosophy of the Upaniṣads*. New York, NY: Cosimo.

Flood, Gavin D. 1996. *An Introduction to Hinduism*. Cambridge, UK: Cambridge University Press.

Grimes, John A. 1995. *Ganapati: Song of the Self*. Albany, NY: SUNY.

Guendelman, Silvia, Sima Medeiros, and Hélène Rampes. 2017. "Mindfulness and Emotion Regulation: Insights from Neurobiological, Psychological, and Clinical Studies." *Frontiers in Psychology* 8: 220. doi.org.

Jansen, Eva Rudy. 2007. *The Book of Hindu Imagery: The Gods and Their Symbols*. Holland, ME: Binkey Kok.

Krygier, Julia R., James A. Heathers, Sahar Shahrestani, Mark Abbott, James J. Gross, and Andrew H. Kemp. 2013. "Mindfulness Meditation, Well-Being, and Heart Rate Variability: A Preliminary Investigation into the Impact of Intensive Vipassana Meditation." *International Journal of Psychophysiology* 89 (3): 305–313. doi.org.

Leeming, David A. 2020. "Viṣṇu." In *Encyclopedia of Psychology and Religion*, edited by David A. Leeming. Cham, CH: Springer. doi.org.

Lehrer, Paul M., and Richard Gevirtz. 2014. "Heart Rate Variability Biofeedback: How and Why Does It Work?" *Frontiers in Psychology* 5: 756. doi.org.

Léonard, Adrien, Sylvie Clément, Chih-Da Kuo, and Mario Manto. 2019. "Changes in Heart Rate Variability During Heartfulness Meditation: A Power Spectral Analysis Including the Residual Spectrum." *Frontiers in Cardiovascular Medicine* 6: 62. doi.org.

Markel, Stephen. 2024. "Hindu Cosmology and Mythology." *Orientations* 55 (6): 39–47.

Melville, George W., David Chang, Bejoy Colagiuri, Paul W. Marshall, and Belinda S. Cheema. 2012. "Fifteen Minutes of Chair-Based Yoga Postures or Guided Meditation Performed in the Office Can Elicit a Relaxation Response." *Evidence-Based Complementary and Alternative Medicine* 2012: 501986. doi.org.

Mikulincer, Mario, and Victor Florian. 2003. "Attachment Style and Affect Regulation: Implications for Coping with Stress and Mental Health." In *Blackwell Handbook of Social Psychology: Interpersonal Processes*, edited by Jeffry A. Simpson and Lorne Campbell, 535–557. Oxford, UK: Blackwell. doi.org.

Nolen-Hoeksema, Susan, and Amelia Aldao. 2011. "Gender and Age Differences in Emotion Regulation Strategies and Their Relationship to Depressive Symptoms." *Personality and Individual Differences* 51 (6): 704–708. doi.org.

Rao, K. Ramakrishna, and Ajit C. Paranjpe. 2016. *Psychology in the Indian Tradition*. New Delhi, IND: Springer. doi.org.

Srinivasa Ayyangar, G. n.d. *The Yoga Upaniṣads*. Adyar Library. Accessed December 21, 2022. archive.org.

Surywanshi, Chanchal, and Neetinakumar J. Patil. 2022. "Methodology of New Meditation Technique." *Sodh Samiksha* 1 (12): 140–145.

Surywanshi, Chanchal, and Neetinakumar J. Patil. 2024. "Conceptualization, Development and Validation of Trimūrti Dhyāna." *Paniniya* 41: 153–161.

Tang, Yi-Yuan, Ying Ma, Yihong Fan, Hongbo Feng, Jian Wang, Shengfeng Feng, Qilin Lu, *et al*. 2009. "Central and Autonomic Nervous System Interaction Is Altered by Short-Term Meditation." *Proceedings of the National Academy of Sciences* 106 (22): 8865–8870. doi.org.

Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology. 1996. "Heart Rate Variability: Standards of Measurement, Physiological Interpretation and Clinical Use." *Circulation* 93 (5): 1043–1065.

Thayer, Julian F., Fredrik Åhs, Mats Fredrikson, John J. Sollers III, and Tor D. Wager. 2012. "A Meta-analysis of Heart Rate Variability and Neuroimaging Studies: Implications for Heart Rate Variability as a Marker of Stress and Health." *Neuroscience & Biobehavioral Reviews* 36 (2): 747–756. doi.org.

Tyagi, Anupama, and Marc Cohen. 2016. "Yoga and Heart Rate Variability: A Comprehensive Review of the Literature." *International Journal of Yoga* 9 (2): 97–113.

Werner, Karel. 1977. "Yoga and the Ṛg Veda: An Interpretation of the Keśin Hymn (RV 10, 136)." *Religious Studies* 13 (3): 289–302.

White, David Gordon, ed. 2012. *Yoga in Practice*. Princeton, NJ: Princeton University Press.

Wolf, David Bruce. 1999. "A Psychometric Analysis of the Three Guṇas." *Psychological Reports* 84 (3): 1379–1390. doi.org.