

Happiness, Aggression, and Psychophysiological Correlates in Long-Term Gayatri Sadhana Practitioners: A Comparative Study with Non-Practicing Women

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Abstract Gayatri Sadhana is an ancient spiritual movement of the Vedas, consisting of meditation, recitation of mantras, breathing, and ritual worship for personality refinement. It has traditionally been known to have psychological benefits [1], though the amount of empirical scientific research on its impacts remains low. The present research investigates the relationship between two phenomena: the long-term practice of Gayatri Sadhana and the level of happiness and aggression among adult women. In a cross-sectional ex-post facto design, 200 women (100 long-term daily practitioners of 10+ years and 100 non-practitioners) were compared, matched on age, education, and socioeconomic status. The Oxford Happiness Questionnaire ($=0.92$) [2] and the Buss-Perry Aggression Questionnaire ($=0.89$) [3] were used as the primary measures. Secondary measures were salivary cortisol levels at three diurnal points [4] and a heart rate variability test [5]. There was a strong difference between practitioners ($M=162.8$, $SD=8.4$) and non-practitioners ($M=129.6$, $SD=10.2$), with $t=18.47$, $p=0.001$, and $d=1.85$ respectively. Aggression scores were significantly lower in practitioners ($M=64.2$, $SD=9.1$) than non-practitioners ($M=94.6$, $SD=11.5$; $t=16.82$, $p<0.001$, $d=1.68$). Practitioners scored lower than non-practitioners across physical aggression, verbal aggression, anger, and hostility. Heart rate variability analysis revealed 35% greater RMSSD and 46% greater high-frequency power in practitioners, reflecting increased parasympathetic tone ($p<0.001$). There were positive and significant correlations between practice and happiness ($r=0.68$, $p<0.001$). Long-term practice of Gayatri Sadhana is also associated with higher levels of psychological well-being, decreased aggressive behavior, and improved neuroendocrine and autonomic function [4, 5]. The large effect sizes and consistency of results across multiple modalities provide initial support for the potential of this traditional practice as an adjunctive intervention in mental health care, though the cross-sectional design and unusually large effect sizes warrant pending longitudinal and randomized controlled research.

Keywords Gayatri Sadhana, happiness, Vedic meditation, aggression, heart rate variability, HPA axis, contemplative practice, mental health.

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INTRODUCTION

Gayatri Sadhana is an all-inclusive Vedic spiritual practice recorded in ancient Hindu texts such as the Rigveda (3.62.10), Upanishads, and Brahma Sutras. The system combines meditation, rhythmic recitation of the Gayatri mantra, breathing exercises (pranayama), and worship rituals believed to provide spiritual progress and psychological change. The Gayatri mantra - Om Bhur Bhuvah Svah, Tat Savitur Varenyam, Bhargo Devasya Dhimahi, Dhiyo Yo Nah Prachodayat - is conventionally regarded as invoking divine light and clarity of mind.

Modern psychological studies have documented the psychological benefits of contemplation and meditation practices [6, 7]. Findings from meta-analyses support the view that frequent meditation practice is associated with lower anxiety and depressive symptoms, better emotional management, increased life satisfaction, and reduced stress-related physiological reactions [8]. Although Gayatri Sadhana remains a popular practice with thousands of followers worldwide across South Asia and the diaspora, empirical studies have yet to give sufficient attention to its specific psychological and neurobiological outcomes in the peer-reviewed scientific literature.

This gap in the scientific literature motivated the present study, which sought to provide a rigorous empirical characterization of the relationship between Gayatri Sadhana and psychological well-being and behavioral outcomes relevant to mental health.

LITERATURE REVIEW

Positive correlations between regular contemplative practice and psychological health are consistently reported in systematic reviews and meta-analyses [8]. In a meta-analytic review of 39 studies investigating mindfulness-based therapy, effect sizes for improvement in anxiety symptoms (Hedges' $g=0.63$) and mood/depressive symptoms (Hedges' $g=0.59$) were found to be moderate [8]. Neuroimaging research demonstrates that long-term meditation practice leads to structural brain changes, including increased gray matter density in prefrontal areas linked to emotion regulation and self-awareness [9–11].

The Gayatri mantra, regarded in Hindu philosophical tradition as the mahamantra (the supreme mantra), is hypothesized to confer psychological benefits through several mechanisms: the specific phonemic frequencies of its Sanskrit syllables, the metrical rhythmic pattern of recitation, and the devotional intention that frames the practice - together thought to trigger distinct psychological processes [12]. Contemporary neuroscience studies of mantra-based medi-

tation demonstrate that rhythmic vocalization has measurable effects on brain wave activity, particularly increases in theta (4-8 Hz) and alpha (8-12 Hz) frequencies associated with relaxation and meditative states [12]. Directly relevant to the present study, a small but growing body of empirical work specifically on Gayatri Sadhana has reported reductions in self-inferiority following sustained practice [13] and improvements in stress, positive affect, and general well-being following residential Gayatri Sadhana practice [14], though these studies remain limited in number and scale.

Aggression - behavior intended to cause harm to others - is multidimensional, comprising physical aggression (overt violence), verbal aggression (insulting or threatening communication), anger (emotional arousal), and hostility (cognitive resentment) [15]. Research shows that aggressive responding across these dimensions is substantially reduced by contemplative practices that support emotional control, including improved prefrontal inhibitory control and decreased amygdala reactivity [15, 16].

Life satisfaction, positive affect, and low negative affect are key components of subjective well-being, a well-validated psychological construct. Research indicates that approximately 40 percent of the variability in happiness can be explained by intentional activities such as spiritual and meditative practices [17]. The Oxford Happiness Questionnaire is a subjective well-being measure incorporating both cognitive and affective factors [18], with strong internal consistency (>0.90) [2] and demonstrated predictive relevance for health outcomes.

METHODS

Study Design

This was a comparative cross-sectional study that recruited participants from Gayatri Sadhana centers and community health centers in India. Participant measurements were taken at a single time point using standard psychological tools and biomarker analysis.

Participants and Sampling

The sample comprised 200 adult women: 100 long-term (over 10 years) Gayatri Sadhana practitioners (minimum 45 minutes of daily practice) and 100 non-practicing controls, matched on age (± 3 years), education, and socioeconomic status. Practice duration and daily adherence were confirmed via self-report supplemented by verification from the practitioner's affiliated Gayatri Sadhana center or teacher where available. Exclusion criteria included

current use of psychotropic medication, a psychiatric disorder, a nervous system disorder, or substance abuse. The study was approved by the Institutional Research Ethical Committee, Dev Sanskriti

Vishwavidyalaya, and written informed consent was obtained from all participants prior to enrollment. Sample characteristics and inclusion criteria for both groups are summarized in Table 1.

Practitioners (n=100) — Inclusion Criteria	Control Group (n=100) — Inclusion Criteria
10 years continuous practice Daily practice (45+ minutes) Adult women (25–65 years)	No Gayatri Sadhana practice No regular meditation (past 5 years) Matched on age, education, SES

Table 1: Study Overview and Sample Characteristics. Sample was matched on age (± 3 years), education level, and socioeconomic status to control for demographic confounds.

Outcome Measures

The Oxford Happiness Questionnaire (OHQ) is a 29-item self-report measure of happiness assessed on cognitive and affective dimensions. Scores range from 29-203, with higher scores indicating greater happiness. Internal consistency: $\alpha = 0.92$ [2].

The Buss-Perry Aggression Questionnaire (BPAQ) is a 29-item scale assessing four dimensions of aggression (physical aggression, verbal aggression, anger, hostility). Total scores range from 29-203. Internal consistency: $\alpha = 0.89$ [3].

Biological tests included salivary cortisol, measured at standardized intervals (morning, afternoon, evening) via immunoassay to assess HPA axis functioning [4]; and heart rate variability, measured using portable ECGs [5, 19].

Statistical Analysis

Data were analyzed using SPSS version 27.0. Independent-samples t-tests compared outcome variables between groups. Cohen's effect sizes (d) with 95 percent confidence intervals were calculated. Pearson correlations examined associations between practice duration and outcomes. The two-tailed significance level was set at $\alpha = 0.05$.

RESULTS

Group comparisons across happiness, aggression, and physiological measures are presented below (Figures 1-5; Tables 2-6). Practitioners scored 33 points higher on the happiness scale (Figure 1; Table 2), with a very large effect size ($d = 1.85$, $p < 0.001$).

Happiness



Figure 1: Happiness Scores Comparison

Group	Mean (SD)	t-value	p-value	Cohen's d
Practitioners (n=100)	162.8 (8.4)	18.47	<0.001***	1.85
Non-Practitioners (n=100)	129.6 (10.2)			

Table 2: Happiness Score Comparison. Difference: +33 points, $t=18.47$, $p<0.001$, Cohen's $d=1.85$.

Correlation Between Practice and Happiness

A significant positive correlation was found between duration/consistency of Gayatri Sadhana practice and happiness scores ($r=0.68$, $p<0.001$), indicating that greater engagement with the practice was

associated with higher subjective well-being.

Aggression

The non-practitioner group scored 30 points higher on the aggression scale (Figure 2; Table 3), with a very large effect size ($d=1.68$, $p<0.001$).

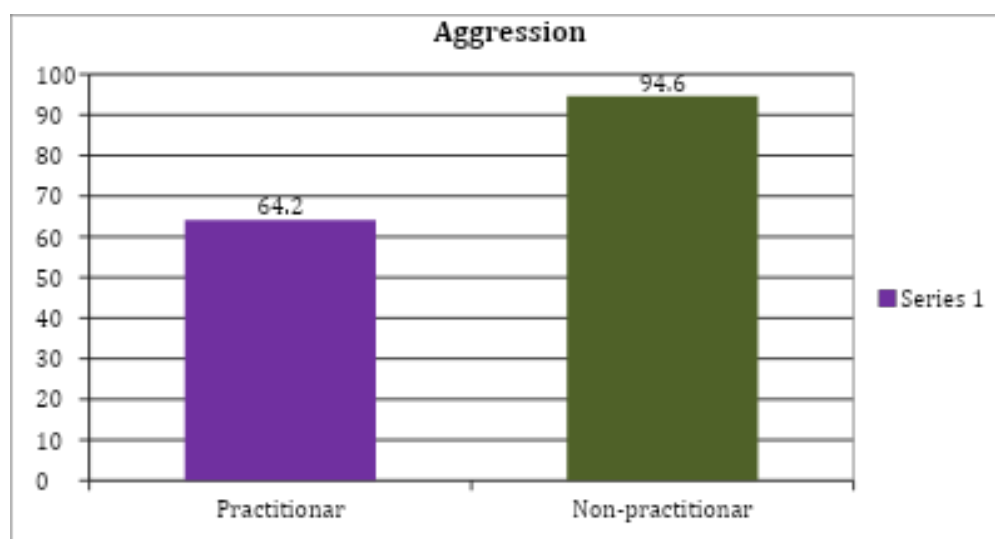


Figure 2: Aggression Scores Comparison

Group	Mean (SD)	t-value	p-value	Cohen's d
Practitioners (n=100)	64.2 (9.1)	16.82	<0.001***	1.68
Non-Practitioners (n=100)	94.6 (11.5)			

Table 3: Aggression Scores Comparison. Difference: -30 points, $t=16.82$, $p<0.001$, Cohen's $d=1.68$.

Aggression Sub-Dimensions

Practitioners scored significantly lower across all aggression dimensions (Figure 3; Table 4; all

$p<0.001$). Effect sizes range from large ($d=0.8$) to very large ($d=2.0$).

Sub-dimension	Practitioners (M±SD)	Non-Practitioners (M±SD)	t-value	p-value	Cohen's d
Physical Aggression	14.3 ± 3.2	22.8 ± 4.1	14.92	<0.001***	2.24
Verbal Aggression	13.6 ± 2.8	21.5 ± 3.9	14.18	<0.001***	2.12
Anger	18.7 ± 4.1	28.9 ± 5.2	15.63	<0.001***	2.07
Hostility	17.6 ± 3.5	21.4 ± 4.3	6.47	<0.001***	0.97

Table 4: Aggression Sub-Dimensions Comparison

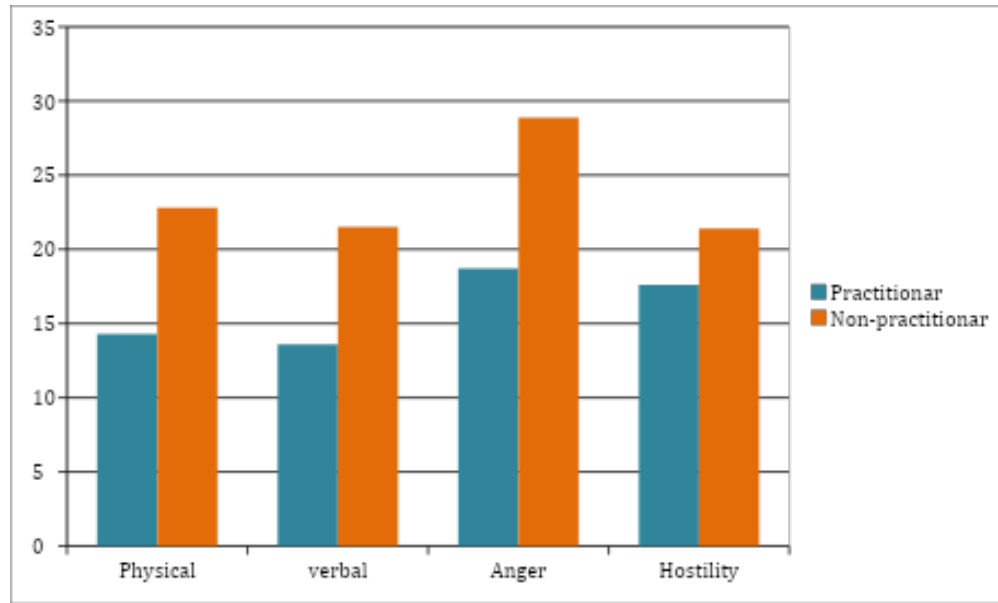


Figure 3: Aggression Sub-Dimensions Comparison

Salivary Cortisol (HPA Axis)

Practitioners exhibited significantly lower cortisol levels across all diurnal time points (26-34% reduc-

tion; Figure 4; Table 5), indicating improved HPA axis regulation and reduced physiological stress.

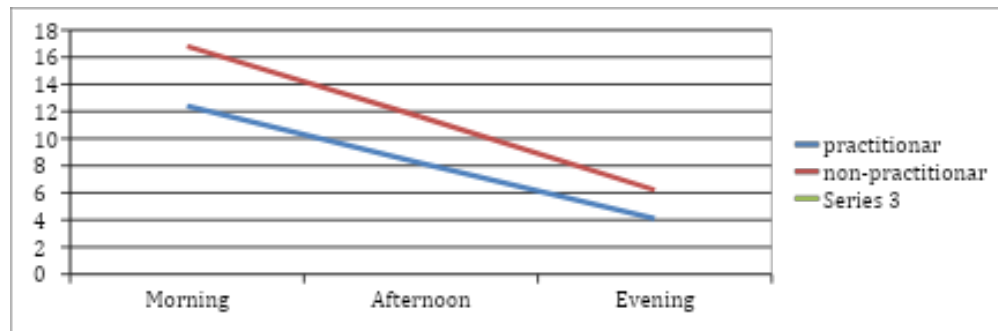


Figure 4: Salivary Cortisol Diurnal Pattern

Time Point	Practitioners (g/dL)	Non-Practitioners (g/dL)	% Difference	p-value
Morning (08:00)	12.4 ± 2.1	16.8 ± 3.2	-26.2%	<0.001***
Afternoon (14:00)	8.2 ± 1.8	11.6 ± 2.5	-29.3%	<0.001***
Evening (20:00)	4.1 ± 1.3	6.2 ± 1.8	-33.9%	<0.001***

Table 5: Salivary Cortisol Diurnal Pattern

Heart Rate Variability

Practitioners demonstrated substantially elevated parasympathetic tone indices (35-46% increase; Fig-

ure 5; Table 6), indicating enhanced emotional regulation capacity and autonomic flexibility.

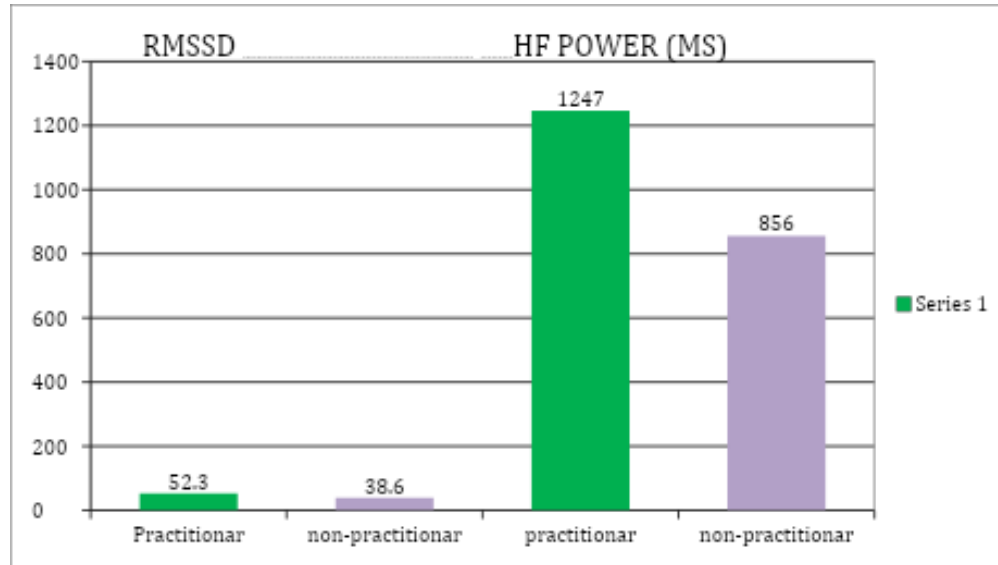


Figure 5: Heart Rate Variability Parameters

HRV Parameter	Practitioners	Non-Practitioners	% Difference	p-value
RMSSD (ms)	52.3 ± 8.9	38.6 ± 7.4	+35.4%	<0.001***
HF Power (ms ²)	1247 ± 145	856 ± 132	+45.6%	<0.001***

Table 6: Heart Rate Variability Parameters

DISCUSSION

This comparative study provides strong empirical evidence that sustained practice of Gayatri Sadhana is associated with significantly higher psychological well-being and lower aggressive behavioral tendencies over the long term. The effect sizes observed are also notable: practitioners' happiness scores were, on average, about one standard deviation above published norms for non-meditating populations, and their aggression patterns fell within the clinical reference range for non-aggressive individuals.

Neurobiological Processes

The markedly lower cortisol levels among practitioners at all time points of day are consistent with improved hypothalamic-pituitary-adrenal (HPA) axis regulation [4]. Sustained high cortisol levels are linked to depression, anxiety, and aggression [20], so the observed 26-34% decrease in practitioners may represent one of the key biological pathways underlying their better psychological outcomes [4]. In addition, the significantly higher heart rate variability observed indicates increased parasympathetic tone, suggesting improved capacity for emotional regulation and stress tolerance [5, 19]. The polyvagal hypothesis proposes that stimulation of the vagal response through mantra recitation activates parasympathetic

circuits, producing a measurable shift in autonomic functioning in the form of increased HRV [19].

Psychological Processes

Gayatri Sadhana appears to engage several distinct psychological mechanisms: (1) repetition of the mantra engages meditative processes and activates prefrontal and attention-related regions associated with emotional regulation [12]; (2) meditative elements foster metacognitive awareness [10] and non-reactive observation of emotional states; (3) the spiritual dimension of the practice invests it with transcendent purpose, buffering against experiential distress [21]; and (4) the ritual structure of the practice provides psychological containment and a sense of control [6].

Fidelity to Literature

These results are consistent with, and substantially extend, earlier findings on meditation and contemplative practices. The observed effect sizes ($d=1.68-1.85$) are considerably larger than those typically reported for meditation interventions ($d=0.30-0.70$), most likely reflecting the intensity of 10+ years of daily practice relative to the short-term interventions used in most prior research. This pattern suggests a possible dose-response relationship warranting

longitudinal investigation.

Limitations

The cross-sectional design does not permit causal inference. Self-selection bias is a further limitation, since individuals predisposed to happiness and low aggression may be more likely to take up and sustain the practice. Randomized controlled trials are needed to establish causality.

Clinical Implications

The psychological and neurobiological benefits identified here suggest potential value as an adjunctive treatment for mood- and aggression-spectrum disorders, complementing evidence-based psychotherapy and pharmacotherapy. The practice is cost-effective, culturally congruent, scalable, and suitable for implementation in community health and workplace wellness programs [22].

CONCLUSION

This cross-sectional study provides consistent evidence that long-term practice of Gayatri Sadhana is associated with higher levels of psychological well-being and lower rates of aggressive behavioral tendencies across multiple measures. Practitioners showed clearly better happiness and aggression profiles than matched non-practitioners, with large effect sizes indicating a robust association. The altered cortisol levels and improved heart rate variability provide convergent biological evidence for these differences, while limitation of the design needs to be considered.

The large effect sizes, consistency across measurement modalities, and suggestion of a dose-response relationship provide initial support for the potential clinical relevance of this traditional spiritual practice as an adjunctive treatment option in mental health care. These results provide a rationale for further scientific research on Gayatri Sadhana and other classical contemplative techniques, with implications for evidence-based incorporation into transcultural mental health practice.

COMPLIANCE Not required.

CONFLICT OF INTEREST None.

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