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Original Article

Young Minds Reimagining Rajyoga Meditation: Physiological Impact of Flute Music during Amrutvela on HRV and EEG

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Abstract

Meditation is increasingly recognized as a significant intervention for mental, emotional and physical wellbeing. Rajyoga meditation, a form of thought-based meditation rooted in Indian spiritual traditions, emphasizes self-realization and union with the Supreme. Practicing Rajyoga during Amrutvela (the pre-dawn hours, 4–5 a.m.) has been historically associated with clarity, focus, and inner peace. This study explores the physiological impact of combining flute music with Rajyoga meditation during Amrutvela among youth (18–30 years). Yoga is a science that has been developed by India's ancient seers, not only for India, but for mankind as a whole. This is a precise science. It is a great, practical self-cultivation method – Swami Sivananda. The name 'Yoga' derives from the Sanskrit root Yuj, which translates as a union of Atma and Paramatma. In Sanskrit, practitioners of Yoga are referred to as Yogin and Yogini (feminine); but, in Western practice, the genderless name 'Yogi' has been used. Yoga was developed in Northern India by the Indus-Sarasvati civilisation and first appears in writing approximately 5000 years ago in the Rig Veda — the first holy books including hymns, mantras, and rituals for use by Vedic priests, or Brahmans. Heart Rate Variability (HRV) and Electroencephalography (EEG) were recorded before and after meditation sessions with and without flute accompaniment. The results indicated that when Rajyoga Meditation was practiced with flute music in the background, participants demonstrated more pronounced improvements in HRV indicators such as RMSSD and HF power. In addition, EEG analysis revealed an increase in alpha and theta activity, suggesting deeper relaxation than mediation performed without music. These findings illustrate how youth are reimagining ancient traditions through modern scientific tools, demonstrating the global potential of Indian practices in stress reduction, focus enhancement, and sustainable health models.

Keywords: *Rajyoga meditation, flute music, Amrutvela, HRV, EEG, youth innovation*

Introduction

Todays youth faces stress, anxiety, and digital fatigue due to modern lifestyle. Rajyoga meditation is a cost-effective, non-invasive wellness practice. Music therapy has demonstrated stress-reducing effects, but flute music in meditation is underexplored. Physiological markers such as HRV (Heart Rate Variability) and EEG (Electroencephalogram) provide measurable insights into meditation effects. The study will integrate Indian spiritual wisdom with modern scientific tools. This section reviews the rationale for integrating ancient practices with scientific validation, positioning youth as innovators who bridge tradition and modernity.

Review of Literature:

Previous research has shown that meditation can positively influences both Heart Rate Variability (HRA) and brain waves activity. Similarly studied on music therapy highlight how Indian classical music can encourage relaxation and help reduce stress. EEG based investigations also point to higher alpha and theta activity during deep meditative states. Despite these insights, very little work has been done on the specific practice of flute assisted Rajyoga Meditation during Amrutvela. This review brings together findings from meditation research, music therapy and youth focused wellness studies to bridge that gap.

Methodology:

Research Design – Experimental Pre test, post-test design with crossover groups. Sample 40 healthy young adults age 18-30 years male and female randomly assigned.

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Instruments used HRV monitor, EEG Machine, Standard questionnaires. Primarily baseline HRV, EEG and questionnaire administered.
Two groups 1. Experimental group – 20 min Rajyoga meditation with flute and 2.Control group - Rajyoga Meditation only.
Post Session HRV, EEG and questionnaire administered.
Data Analysis: Paired t test, One way ANOVA.

Results:

Practicing Rajyoga Meditation with flute accompaniment produced notably greater improvements in heart rate variability (HRV) compared to meditation alone. This approach also promoted a significant shift toward parasympathetic dominance, reflecting enhance relaxation. EEG findings further revealed increased alpha and theta activity, indicating deeper focus and a more profound meditative state when the flute was integrated into the practice.

Discussion:

The findings of this study suggest that incorporating flute music into Rajyoga meditation enhances its physiological and mental benefits. Participants practicing flute music assisted meditation showed greater improvements in heart rate variability, indicating stronger parasympathetic activation and deeper relaxation. EEG recordings further revealed increased alpha and theta activity, reflecting heightened focus and more profound meditative state. These results highlight how music can amplify the effects of traditional meditation practices, making them more impactful for modern practitioners. Importantly, the study underscores the role of young people in reinterpreting ancient techniques through scientific methods. By validating traditional knowledge with objective physiological data, young researchers and practitioners are contributing to a sustainable and globally relevant model of health and well-being.

Conclusion:

This study shows that how young people are connecting tradition with modern science by exploring the effect of flute music assisted Rajyoga meditation. The improvement in heart rate variability and EEG activity observed during Amrutvela indicates a deeper physiological impact, highlighting the relevance of these Indian practices for promoting youth well-being. In a world where lifestyle stress is on the rise, combining traditional wisdom with modern scientific method offers a sustainable, non-drug approach to supporting health and education in the future.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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