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IMPACT OF KAPI RAGA–BASED MUSIC THERAPY ON STRESS REDUCTION AMONG WORKING WOMEN

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ABSTRACT

This study examines a traditional approach for enhancing mental health by Kapi Raga-based music therapy in assisting working women in coping with the chronic stress associated with balancing professional and personal responsibilities. This type of workload can lead to emotional exhaustion that affects the whole family. This study used Kapi Raga because it is deeply emotional and calming, and it can touch the heart and release suppressed emotions through soft melodic oscillations. It was based on the "Indian Way" of using ancient wisdom to solve modern problems. Over the course of two months, participants attended short, daily sessions to see whether this melodic framework could effectively control both the mind and the body. The results showed a clear change: women who practiced the therapy reported feeling less stressed and had lower levels of cortisol in their blood, while those who did not practice the therapy saw their perceived tension and biological stress markers rise. This clear drop in cortisol levels suggests that the therapy helps the body's stress response system work less hard. The study's main conclusion is that adding these simple, short-term musical interventions to everyday life can help people feel better emotionally and improve family well-being without drugs or surgery.

KEYWORDS: *Kapi Raga, Music Therapy, Working Women, Serum Cortisol, Perceived Stress Scale, Occupational Stress, Emotional Regulation, Quasi-experimental Design.*

1. INTRODUCTION

Among working women in contemporary society, occupational stress has become a significant health concern. Balancing professional responsibilities along with family obligations, social roles, and personal expectations, women have become prone to

psychological strain, leading to excessive stress, anxiety, and emotional exhaustion (Kapse, 2025). Continuous stress poses many health problems on both physical and emotional levels; as a result, individuals may experience sleep disturbances, reduced work performance, impaired interpersonal relationships, and an increased likelihood of developing psychosomatic disorders. Identifying effective interventions to tackle stress is both socially and clinically significant.

Traditional gender norms are slowly changing in emerging economies like India, driven by the rapid expansion of the service sector, globalization, and industrialization over the last several decades. This has led to a dramatic increase in the number of women working worldwide (Patel, P., & Sharma, A., 2025). This advancement is a huge step in the right direction, but it has also brought many new problems, such as stress and mental health issues in the job, that women face in professional settings (Basu, S. 2018). "Stress" is a term used to describe the impacts of anything that disrupts physiological equilibrium. Humans are particularly susceptible to the negative consequences of chronic stressors, presumably because of their strong capacity for symbolic cognition, which can evoke persistent stress responses to a wide range of stressful living and working environments (Ramalingam et al., 2022). The rising participation of women in the workforce has led to greater attention to the psychological and social factors that contribute to workplace stress (Rani, S., & Lakshmi, U., 2024). Recently, there has been increasing global concern about the rising prevalence and rapid progression of psychosomatic disorders (PSDs). The term "psychosomatic" is derived from the Greek words "psyche" (soul) and "soma" (body) (Devi et al., 2024). This surge can be attributed to irregular biological conditions and increasingly stressful lifestyles, ultimately resulting in functional impairments of vital organs (Chauhan, A. et al., 2023). Depression and other mental disorders drastically lower the quality of life and the ability of patients to stick to their treatment. The patient will not be able to hold or tolerate the anxiety of illness, and this causes emotional distress, which impairs the patient's ability to work on specific areas of life that are important. Walter Cannon (1871-1945) was the first person to direct and structure the relationship between stress and disease. He indicated that the autonomic nervous system, primarily the sympathetic system, prepares the organism for the "fight or flight" response, as evidenced by hypertension and increased cardiac output (Devi et al., 2024).

MUSIC INTERVENTION

Music therapy in recent times has gained recognition as a non-pharmacological intervention to address not only stress and anxiety but also other health problems (Wu & Yao, 2023). Music interventions are intentional music activities that engage hearing with pre-taped music provided by a clinician or healthcare professional, are self-administered by the person, or involve music creation or singing without the involvement of a professional musician or a therapeutic context (Ramalingam et al., 2022). Chronic stress is a pervasive global health issue linked to psychological and physiological disorders (Sumerjana et al., 2025). Music is known to influence mood and emotion and regulate autonomic nervous system activity, thereby providing relaxation. Music therapy is a goal-oriented and purposeful practice in which therapists use musical expression and the memories, emotions, and experiences it evokes to work with individuals or groups. Today, music therapy can be studied through clinical practice and is a very effective tool for managing stress. Music therapy uses various components of music, such as melody, timbre, rhythm, harmony, and pitch, to support and enhance physical, psychological, and social well-being (Lu et al., 2021). In earlier times, music was an integral part of everyday life. It was closely associated with rituals, temples, daily chores, and entertainment. Traditional healing systems have always held music therapy in high regard. As more scientists study how the mind and body work together, these traditional methods are now being examined using modern research techniques. In this article, we look at how music therapy, especially the raga Kapi, can help manage stress-related issues.

RESEARCH OBJECTIVE AND HYPOTHESIS

The present study investigated whether music therapy can significantly reduce cortisol levels and reduce perceived stress in adults experiencing elevated stress levels.Wehypothesised that music therapy would lead to a statistically significant decrease in cortisol levels and a reduction in self-reported stress scores compared to the control group.

2. METHOD

2.1.Design and Sample

The present study used a quasi-experimental pre-test and post-test control group design to assess the effectiveness of music therapy in reducing stress levels among working women. The independent variable for the present study is Raga Kapi, and the dependent variable is stress. By a convenient purposive sampling method, a total of 100 women

working in Tirupati, in the state of Andhra Pradesh in India, were recruited for the study. The inclusion criteria followed to choose the participants include those who are employed, those interested in music, those without major auditory impairments, and those belonging to the age category of 30 to 60 years.

2.2. Research Instruments

Perceived Stress Questionnaire Index (PSQI) was used in this to measure the stress in the participants (Levenstein et al., 1993). This questionnaire, consisting of 30 questions uses a 4-point Likert scale from 1 (almost never) to 4 (usually) and focuses on intellectual and emotional symptoms of stress. Before the final score is calculated, eight items with positive approach are reverse-scored to make sure the direction is always the same. To calculate the global PSQ index, use the formula (Calculated Score - 30) / 90 (Kocalevent et al., 2007). The PSQI is well-known for how well it measures things and how well it can find changes in stress levels in both healthy and sick people.

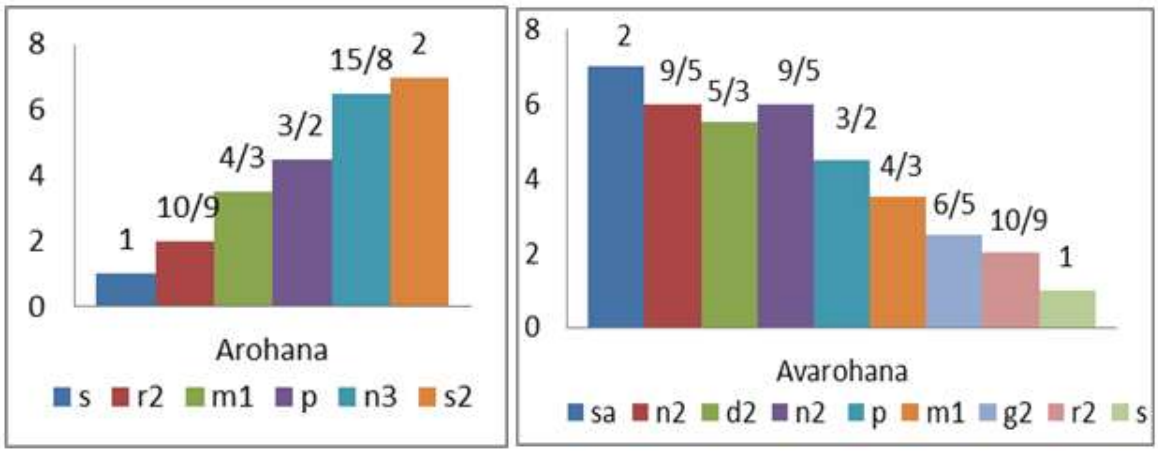
Perceived Stress Scale (PSS) was utilized to evaluate as well as understand the overall perceived stress levels of the participants (Cohen et al., 1983). There are 10 items on the scale, and each one is rated on a 5-point Likert scale from 0 (never) to 4 (very often). Before adding up the total score, some items that were answered positively are given a negative score. The overall score can be anywhere from 0 to 40, with higher scores meaning that the person feels more stressed. To make it easier to understand, the total scores were divided into three groups: low stress (0–13), moderate stress (14–26), and high stress (27–40). The PSS is widely recognized for having strong psychometric properties and has shown that it is reliable and valid across a wide range of groups (Lee, 2012).

Serum Cortisol Levels (SCL) was used to assess the physiological effects of stress. Cortisol is often referred to as the "stress hormone" because the body releases more of it into the blood when a person is under stress (Hanson et al., 2006). The researchers could see the actual biological level of stress in the body by taking blood samples from the people who took part in the study. Cortisol levels fluctuate throughout the day, especially we observe high cortisol levels in the morning. Thus, all blood samples were obtained simultaneously to ensure fairness and consistency in the results (Smyth et al., 2002).

2.3. Carnatic Raga Kapi based Music Therapy

India possesses a longstanding tradition of utilizing music for therapeutic purposes, a practice that extends over millennia. Raga Chikitsa is defined as the knowledge of how to employ raga for healing purposes. By influencing emotional states and modulating brain wave patterns, ragas may serve as a complementary form of medicine.

It is posited that the human body is governed by the three Doshas: Kapha, Pitta, and Vata. These elements operate in a cyclical pattern, fluctuating throughout the 24-hour period. Furthermore, the response of these elements varies with time. Consequently, it is suggested that performing or listening to a raga at an appropriately selected time can impact human health.



Kapi ragam evokes feelings of devotion, sentiment, and happiness. Kapi is a raga in Carnatic music, classified as a janya raga derived from the 22nd melakarta scale, Kharaharapriya. Kāpi is an audava-vakrasampoornarāgam, featuring an ascending pentatonic scale and a descending scale with seven notes, albeit not in a sequential order. The incorporation of Kakali Nishadam and Anthara

Gandharam renders it a Bhashanga Raga, a raga with foreign notes. The sphuritha and kampitagamakas of Kapi raga fulfill the requirements of a lullaby(Saroja, 2024). Kapi raga is a therapeutic South Indian classical (Carnatic) raga employed in music therapy to calm the mind, alleviate mental disorders, and address depression and anxiety. It fosters tranquility, reduces stress, and aids in mitigating absent-mindedness, thereby enhancing mental well-being.

2.4. Procedure and intervention

Initially, approval was obtained from the Institutional Ethics Committee (IEC). Subsequently, working women aged 30 to 60 years were identified and recruited for the study. The purpose and objectives of the study were explained to the participants, and informed consent was secured. Participants then completed a series of demographic questions and a baseline measurement questionnaire. Blood samples were collected to assess baseline cortisol levels and to screen for any underlying health conditions or diseases. Based on the scores obtained from the Perceived Stress Questionnaire index, stress scores, and biochemical analysis, participants were uniformly allocated to two groups: control and experimental. The control group was not exposed to music therapy, while the experimental group was instructed to listen to vocal and instrumental music in Raga Kaapi for 10 minutes over a span of two months. All participants listened to the same vocal and instrumental music set to Raga Kaapi. After the completion of the two-month music therapy, post-intervention blood samples were collected, and serum cortisol levels were re-evaluated to assess changes in physiological stress. The control group was also reassessed to monitor any natural variations over the same period. The Perceived Stress Scale questionnaire was circulated to obtain post-interventional stress scores. The stress scores and serum cortisol values obtained were statistically analyzed to test the hypothesis.

2.5. Data analysis

Data were analysed using SPSS version 20, and descriptive statistics and the paired sample t-test were used to generate results. When the observations are obtained in pairs, this is used to compare mean differences pre and post music intervention for the variables under consideration, including Perceived Stress Scale (PSS), Perceived Stress Quality Index (PSQI), and Serum Cortisol Level (SCL).

Additionally, Pearson correlation analysis was employed to determine the relationship between variables within and between the groups. Statistical significance was evaluated at the 0.05, 0.01, and 0.001 levels to determine the strength and reliability of the findings.

3. RESULTS

Table 1 shows the demographic details of the participants of the study. The study population consisted of 100 working women, whose socio-demographic and lifestyle characteristics revealed several protective factors and health trends.Walking was the most common type of physical activity among participants (64%), followed by yoga (20%), and 32% of the sample engaged in 2 to 4 hours of physical activity per week. While 32% of participants had never meditated, those who had favored breathing exercises (27%) and silent or mindful meditation (39%) with consistent daily practice. With 37% listening to music regularly and 39% a few times per week, there was a high level of musical engagement for relaxation, with most people choosing classical, instrumental, or ambient sounds. Furthermore, since more than half of the participants (53%) spent more than 10 hours a week with their families, social support seemed to be strong within the group. The majority of the sample showed noticeably moderate levels of stress, especially those who had health conditions like migraines, gastritis, and insomnia.

As shown in Table 2, the paired sample t-test indicates a significant difference in the scores of perceived stress between the pre-test and post-test assessments for both experimental groups $t(49) = 7.703$ and the control group $t(49) = -4.796$, $p < 0.001$. For the experimental group, there was a statistically significant improvement, with mean stress scores dropping from 81.78 (SD = 10.122) at pre-test to 72.28 (SD = 10.124) at post test. Conversely, the control group exhibited a significant deterioration in stress levels over the same duration, as evidenced by an increase in mean scores from 77.82 (SD = 8.123) to 84.92 (SD = 8.926). These diverging results indicate that the intervention not only successfully mitigated stress in the treatment group but also prevented the elevation of stress observed in the treated participants.

Also, the analysis of stress questionnaire scores reveals a statistically significant improvement for the experimental group, with mean scores decreasing from 0.575 (SD = 0.112) at the pre-test to 0.460 (SD = 0.130), $t(49) = 6.495$, $p < 0.001$ at the post-test. Conversely, the the control group demonstrated a significant increase in stress severity scores, as indicated by an increase in mean scores from 0.531 (SD = 0.090) to 0.601 (SD = 0.129), $t(49) = -3.215$, $p <$

0.002. These divergent results suggest that those in the control group experienced a measurable increase in stress-related symptom intensity.

Regarding the biological markers of stress, Table 3 shows that the experimental group achieved a statistically significant reduction in Serum Cortisol levels, with mean values dropping from 8.242 (SD = 0.933) at the pre-test to 6.515 (SD = 1.834) at the post-test, $t(49) = 6.925$, $p < 0.001$. In sharp contrast, the control group's Serum Cortisol levels increased significantly during the study period, rising from a mean of 7.054 (SD = 2.418) to 9.641 (SD = 2.464), $t(49) = -6.986$, $p < 0.001$.

These physiological data points mirror the psychological results found in Tables 2, providing strong biological evidence that the intervention successfully down-regulated the physiological stress response while the control group experienced heightened biochemical stress.

Table 1. Socio - Demographic Characteristics of the Study Population (N = 100)

Characteristic	Category	Frequency
Physical Activity Type	Walking	64
	Yoga	20
	Running	01
	Other	25
Weekly Activity Duration	0 - 1 hours	33
	2 - 4 hours	32
	5 - 7 hours	12
	More than 8 hours	14
Meditation Practice	Never	32
	Rarely	27
	Occasionally	20
	Yes, regularly	18
Type of Meditation	Silent / Mindful	39
	Breathing Exercises	27
	Guided Meditation	02
	Other	17
Music for Relaxation	Daily	37
	Few times a week	39
	Rarely	17
	Never	06
Weekly Family Time	More than 10 years	53
	4 - 6 hours	22
	6 - 8 hours	16
	8 - 10 hours	08

Table 2. Mean, SD, paired sample t test, effect size for pre-test and post-test comparison on Stress for both Control group and Experimental group.

Variable		Pre-test			Post-test			t	df	p
		Mean	SD	SEM	Mean	SD	SEM			
PerceivedStress Scale (PSS)	Experimental Group	81.78	10.122	1.432	72.28	10.124	1.432	7.703	49	.000
	Control Group	77.82	8.123	1.149	84.92	8.926	1.262	-4.796	49	.000
Perceived Stress Questionnnaire Index (PSQI)	Experimental Group	0.575	0.112	0.015	0.460	0.130	0.018	6.495	49	.000
	Control Group	0.531	0.090	0.012	0.601	0.129	0.018	-3.215	49	.002

Table 3. Mean, SD, paired sample t test, effect size for pre-test and post-test comparison on Serum Cortisol for both Control group and Experimental group.

Variable		Pre-test			Post-test			t	df	p
		Mean	SD	SEM	Mean	SD	SEM			
Serum Cortisol	Experimental Group	8.242	0.933	0.273	6.515	1.834	0.259	6.925	49	.000
	Control Group	7.054	2.418	0.342	9.641	2.464	0.348	-6.986	49	.000

4. DISCUSSION

In contemporary society, women's active participation in the workforce is a fundamental driver of economic strength and industrial transformation, highlighting the transition toward a more interconnected and diverse international labour market (Keidanren, 2014; Press Information Bureau, 2024; Zhang et al., 2022). This evolving role requires a comprehensive examination of how professional responsibilities intersect with personal well-being, influencing the health outcomes of a substantial demographic. As available, non-disruptive strategies to maintain psychological balance. Music therapy is a proven way to help people heal and cope with stress, making it a valuable tool for addressing the challenges of modern work life (Feng & Wang, 2025). Studies suggest that listening to music you like makes your brain release dopamine, which can improve your mood and make you feel intense emotions like joy, sadness, or fear. By doing so, individuals can actively manage their emotional states in high-pressure situations (Burgess, 2024).

4.1 Influence of Socio-Demographic and Lifestyle Characteristics

The demographic profile reveals that almost all the participants are involved in physical activities like Walking (64%) and yoga (20%),53% of participants reported spending significant weekly time with family, suggesting relatively strong social support systems.

Despite these protective variables, participants demonstrated moderate stress levels at baseline. This indicates that lifestyle engagement alone may not sufficiently buffer occupational and psychosocial stress in working women. Many participants also reported health concerns such as migraines, gastritis, and insomnia—conditions frequently associated with chronic stress activation and dysregulation of the hypothalamic–pituitary–adrenal (HPA) axis.

4.2 Efficacy of Kapi Raga in Psychological Stress Reduction

The experimental group demonstrated a statistically significant reduction in perceived stress scores ($t(49) = 7.703$, $p < 0.001$), with mean values decreasing from 81.78 to 72.28. In contrast, the control group exhibited a significant increase in stress levels ($t(49) = -4.796$, $p < 0.001$), with mean scores rising from 77.82 to 84.92.

The increase in post-test stress scores within the control group is particularly noteworthy. If the data collection period overlapped with:

- Academic deadlines,
- Workplace evaluation cycles,
- Financial year-end reporting,
- Family or social obligations, then stress, sleep disturbances, and cortisol levels may naturally escalate over time. This phenomenon is especially common among:
- Working adults,
- Women managing dual work–family roles,
- Caregivers with high emotional labour demands.

Thus, the elevated post-test scores (AMT) in the control group likely reflect natural time-related stress progression and heightened stress exposure during the post-intervention phase.

Importantly, while stress increased in the absence of intervention, it significantly decreased in the music therapy group. This divergence strengthens the interpretation that Kapi raga functioned not merely as a relaxant but as a protective psychological regulator.

4.3 Physiological Down-Regulation: The Cortisol Connection

Serum cortisol levels provide objective biological evidence of stress regulation. The experimental group exhibited a significant reduction in cortisol levels (from 8.242 to 6.515; $t(49) = 6.925$, $p < 0.001$), whereas the control group showed a significant increase (from 7.054 to 9.641; $t(49) = -6.986$, $p < 0.001$).

Cortisol is a primary biomarker of HPA-axis activation and is closely associated with chronic

stress, inflammation, metabolic imbalance, and psychosomatic disorders. The parallel reduction in both psychological stress scores and cortisol levels in the experimental group indicates that music therapy influenced not only subjective experience but also endocrine regulation.

4.4.Changes in Perceived Stress Quality Index (PSQI)

The analysis of Perceived Stress Quality Index (PSQI) scores revealed a statistically significant improvement in the experimental group ($t(49) = 6.495$, $p < 0.001$), with mean scores decreasing from 0.575 to 0.460. Conversely, the control group demonstrated a significant increase in stress quality index scores ($t(49) = -3.215$, $p < 0.002$), indicating a worsening stress profile over time.

Unlike the Perceived Stress Scale (PSS), which captures subjective stress perception, the PSQI in the present study reflects the qualitative intensity and functional impact of stress symptoms. The reduction in PSQI scores among participants exposed to Kapi raga suggests that the intervention not only reduced perceived stress levels but also improved the overall stress-related quality profile of the individuals.

The increase observed in the control group indicates that, in the absence of intervention, stress severity and functional impact may naturally intensify over time due to occupational pressures and environmental demands.

4.5. Influence of Lifestyle and Social Support

Although many participants reported engagement in physical activity and family interaction, these variables did not prevent stress escalation in the control group. This suggests that while lifestyle factors contribute to resilience, they may not be sufficient in the absence of structured stress-modulating interventions.

Music therapy may have acted as:

A cognitive-emotional reset,

A structured relaxation ritual,

A consistent parasympathetic activator,

A mindful auditory engagement.

The regularity of listening (10 minutes daily) may have created a rhythmic regulatory mechanism, stabilizing emotional fluctuations across the two-month period.

Kapi Raga as a Preventative Intervention

5.CONCLUSION

The study's strong empirical data show that Kapi Raga-based music therapy is a good way to lower working women's psychological and physical stress without using drugs. During a planned two-month period, participants in daily 10-minute sessions of Raga Kapi had statistically significant drops in their Serum Cortisol Levels (SCL), Perceived Stress Scale (PSS), and Perceived Stress Quality Index (PSQI) ratings.

Conversely, the control group exhibited a notable increase in stress indicators across physiological and psychological dimensions, suggesting that stress would inherently escalate over time without intervention.

The experimental group's simultaneous reduction in objective cortisol levels and subjective stress perception indicates that the intervention influenced both emotional regulation and hypothalamic–pituitary–adrenal (HPA) axis function. This dual-level effect substantiates the scientific validity of raga-based music therapy as a structured psychophysiological regulatory mechanism rather than merely a relaxation technique.

Participants indicated involvement in familial bonding, meditation, and physical exercise; however, these protective lifestyle factors were insufficient to inhibit the progression of stress within the control group. This research underscores the importance of intentional and consistent stress-modulating techniques in alleviating occupational stress among working women.

Utilizing modern scientific methodologies, Kapi, originating from the ancient Indian system of Raga Chikitsa and derived from the 22nd Melakarta Kharaharapriya, demonstrates measurable therapeutic potential. The results support the integration of culturally relevant, time- and cost-effective musical interventions into community mental health initiatives and corporate wellness programs.

In short, Kapi Raga-based music therapy is a safe, easy-to-get, and scientifically backed way to reduce stress. It may be a part of preventative mental health care for working women because it can lower signs of physical stress and mental distress. Subsequent research employing randomized controlled trials with larger and more diverse populations may validate its long-term benefits and applicability.

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