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A Pilot Investigation into the Effects of Yogic Practices on Cortisol Management and Sleep Quality among Insomniac Older Women

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Abstract: The goal of this investigation was to determine whether yogic practices have any effect on cortisol levels and the quality of sleep among elderly women who were experiencing insomnia. Using a random sample technique, 30 elderly insomniac women from Kerala between the ages 60 and 70 years were chosen at random for the study. Fifteen subjects were allotted into two groups: I (Experimental) and II (Control). On particular physiological and psychological factors, such as cortisol and sleep quality, it was expected that older women with insomnia would differ significantly from the control group. Before the training program began, two groups underwent preliminary tests on their cortisol and sleep quality. Six days a week for a total of eight weeks, 60 min of yogic exercises were delivered to group I subjects. The Control Group, Group II, was in active rest. The two groups were retested using the same chosen dependent variables following the experimental period. To determine the significant differences between the experimental group and the control group, analysis of covariance (ANCOVA) was utilized. The test of significance was fixed at 0.05 level of confidence. The study's findings demonstrated that due to yogic practices, the Experimental Group significantly differed from the Control Group on a physiological and psychological variables, including Cortisol (which balanced) and Sleep Quality (which improved). At a 0.05 level of confidence, the hypothesis was accepted. In order to maintain appropriate cortisol levels and enhance the quality of sleep, old ladies suffering from insomnia can benefit from yogic practices.

Keywords: Yoga, Insomnia, Sleep, Stress, Depression

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Introduction

Ninety-three per cent of the Indian population suffers from sleep deprivation, and insomnia affects approximately thirty to forty per cent of

adults. Insomnia can contribute to various health issues such as diabetes, hypertension, and weight gain, while also having a detrimental impact on

mental health. Yoga, a proven stress-reduction technique, holds potential for enhancing sleep quality. Specific yoga practices can activate the parasympathetic nervous system, thereby improving sleep quality. Additionally, yoga can regulate hormone secretion, ensuring the right balance at the appropriate times. Hormones like cortisol, closely linked to sleep quality, can be positively influenced by yoga. Better sleep quality, in turn, promises an improved overall quality of life.

Nonetheless, there exists a limited number of studies examining the impact of yogic practices on elderly women suffering from insomnia. This study is designed to investigate the potential influence of yoga techniques on cortisol levels and sleep quality in this specific demographic of older women.

Insomnia, also referred to as sleeplessness, is a common condition that is associated with higher morbidity and a lower quality of life. A number of chronic illnesses that affect individuals in general can be effectively treated with yoga. Nonetheless, there is a scarcity of research on the applicability of yoga as a treatment for insomnia among older individuals. The objective of the study was to find out whether there would be any significant difference on Biochemical and Psychological variables (Cortisol and Sleep Quality) due to practice of yoga, among middle aged women suffering with Insomnia.

The studies by Thirthalli *et al.* (2013) and Fang *et al.* (2015) provide valuable insights into the potential benefits of yoga practices on both mental health and sleep quality. Thirthalli *et al.* (2013) study focused on the antidepressant effects of yoga and its role in reducing serum cortisol levels in depressive patients. They found that patients who received yoga, either with or without medication, experienced a significant drop in cortisol levels compared to those who received medication alone. This suggests that yoga may serve as an effective anti-stress agent, contributing to the reduction of cortisol levels. This study highlights the potential of yoga as a

complementary therapy for mental health conditions.

Fang *et al.* (2015) explored the impact of yoga on sleep quality and work stress among nurses. Their research revealed that nurses who engaged in yoga for six months, practicing more than twice a week for 50-60 min each session, exhibited improved sleep quality and reduced work stress compared to a control group that did not receive any treatment. This study underscores the positive effects of yoga on sleep quality and its potential to alleviate work-related stress, offering practical benefits for healthcare professionals.

Both studies contribute to the growing body of evidence supporting the therapeutic potential of yoga in promoting well-being, reducing stress, and improving mental health and sleep quality.

The delimitations of this study are:

- This study exclusively focused on women residing in Kerala, restricting the generalizability of findings to this specific region.
- The study's subjects were confined to individuals aged between 60 to 70 years, limiting the applicability of results to this particular age group.
- The chosen independent variable was exclusively Yogic Practices, disregarding other potential factors that may influence cortisol levels and sleep quality.
- The study solely examined cortisol levels and sleep quality as the dependent variables, excluding other potential variables that could impact the research outcomes.

The limitations of this study are:

- This study did not account for factors such as lifestyle choices, body structure, and engagement in social activities, which could potentially influence the outcomes.
- The study did not consider family heredity and motivational factors as variables, which may

play a role in the subjects' cortisol levels and sleep quality.

- Variations in environmental and climatic conditions, as well as socioeconomic backgrounds and daily routines, were not factored into the study, although they could affect the results.
- The study did not take into account variables like diet, medication, and personal habits, which can have a substantial impact on cortisol levels and sleep quality among the subjects.

Materials and Methods

Subject Selection:

Identified 46 elderly women with insomnia from Kerala and filtered them to 30 subjects aged between 60-70.

Random Assignment:

The 30 subjects were randomly assigned to two groups - an experimental group (n=15) and a control group (n=15).

Intervention for Experimental Group:

The experimental group received yoga training for 8 weeks, six days a week, with each session lasting one hour in the morning. Yogic practices involved, Pawanmuktasana Series-1 (Bihar School of Yoga), Shashangasana, Chandra Bedhana, Brahmari, and Yoga Nidra.

Control Group:

The control group was in active rest during the study period, allowed to continue their routine and normal activities.

Data Collection:

Data was collected on cortisol levels and Pittsburgh Sleep Quality Index (PSQI) scores for both groups before and after the intervention.

Statistical Analysis:

The data pertaining to the variables collected from two groups before and after the training period were statistically analysed by using

Analysis of Co-Variance (ANCOVA) to determine the significant difference and tested at 0.05 level of significance.

Results and Discussion

Cortisol:

The obtained F value on pre-test scores 0.14 was lesser than the recommended F value of 4.2 to be significant at 0.05 level. This shows that there was no significant difference between the groups before the training period. There are significant differences between groups after the completion of training program, as obtained F value 51.60 was greater than the required F value of 4.2. This proved that the differences between the post-test means of the subject were significant. On account of adjusted pre-post-test mean scores, the obtained F value 53.39 was greater than the required F value of 4.21. This proved that there was a significant difference among the means due to eight weeks of yogic practices on Cortisol. This is in agreement with the study conducted by Thirthalli *et al.* (2013). The pre-test, post-test and adjusted post-test mean values of yogic practices and the control group on Cortisol are illustrated in Table 1 and Figure 1.

Sleeping Quality Index:

The obtained F value on pre-test scores 0.60 was lesser than the recommended F value of 4.2 to be significant at 0.05 level. This shows that there was no significant difference between the groups before the training period. There are significant differences between groups after the completion of training program, as obtained F value 57.33 was greater than the required F value of 4.2. This proved that the differences between the post-test means of the subject were significant. On account of adjusted pre-post-test mean scores, the obtained F value 58.97 was greater than the required F value of 4.21. This proved that there was a significant difference among the means due to eight weeks of yogic practices on PSQI scores. This is in conformity with the study conducted by Fang *et al.* (2015). The pre-test, post-test and

Table 1: Computation of analysis of covariance of experimental group and control group on cortisol (scores in mcg/dl)

TEST	GROUP 1	GROUP 2 CONTROL GROUP	SOURCE OF VARIANCE	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SUM OF SQUARES	F- RATIO
Pre	25.45	25.17	Between	1	0.60	0.60	0.14
			Within	28	116.02	4.14	
Post	16.81	25.71	Between	1	594.16	594.16	51.60*
			Within	28	322.42	11.51	
Adjusted Post	16.76	25.76	Between	1	605.26	605.26	53.39*
			Within	27	306.09	11.34	

*Significant at 0.05 level of confidence (Table F-ratio at 0.05 level of confidence for 1 and 28 (df) = 4.2, 1 and 27 (df) =4.21)

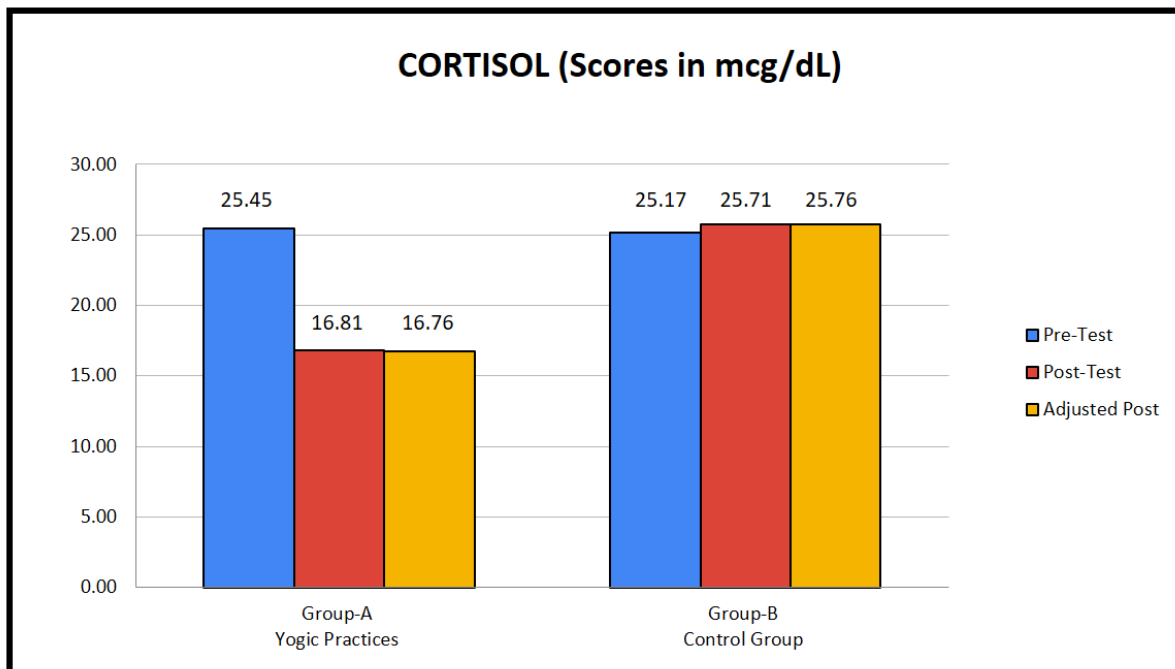


Fig. 1: Mean differences among the experimental and control group on cortisol. *Significant at 0.05 level of confidence. (Table F-ratio at 0.05 level of confidence for 1 and 28 (df) =4.2, 1 and 27 (df) =4.21).

Table 2: Computation of Analysis of Covariance of experimental group and control group on PSQI scores

TEST	EXP GROUP I	CONTROL GROUP GROUP 2	SOURCE OF VARIANCE	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SUM OF SQUARES	F-RATIO
Pre	14.60	13.93	Between	1	3.33	3.33	0.60
			Within	28	156.53	5.59	
Post	8.00	15.07	Between	1	374.53	374.53	57.33*
			Within	28	182.93	6.53	
Adjusted Post	7.93	15.14	Between	1	382.39	382.39	58.97*
			Within	27	175.08	6.48	

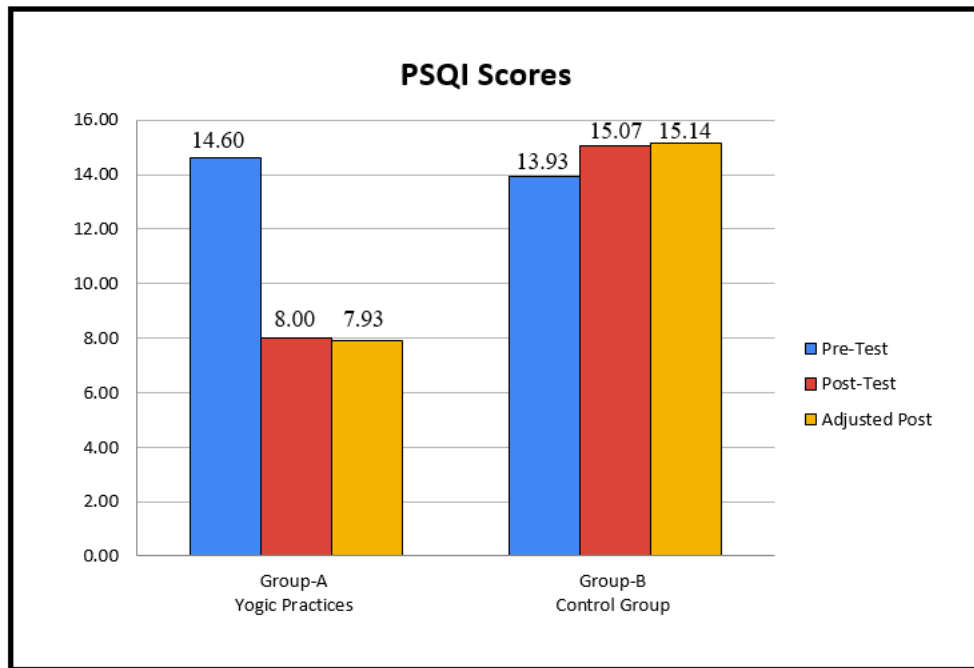


Fig. 2: Mean differences among the experimental and control group on PSQI scores. *Significant at 0.05 level of confidence.(Table F-ratio at 0.05 level of confidence for 1 and 28 (df) =4.2, 1 and 27 (df) =4.21).

adjusted post-test mean values of yogic practices and the control group on Sleep Quality are presented in Table 2 and Figure 2.

The outcome of the study exhibits that Cortisol Levels decreased and Sleep Quality improved significantly due to Yogic Practices for Group-I

than Group II. Hence the hypothesis was accepted at 0.05 level of confidence. These findings are also substantiated by the observations made by Thirthalli *et al.* (2013) and Fang *et al.* (2015).

It was hypothesized that there would be significant differences on selected Biochemical

variable such as Cortisol and Psychological variable such as Sleep Quality due to Yogic practices among aged insomniac women than the control group. The results proved that there were significant differences on Cortisol (decreased) and Sleep Quality (Improved) than the control group among aged insomniac women due to Yogic Practices.

Conclusion

It was concluded that Yoga practices (Group A) significantly decreased Cortisol and improved Sleep Quality among Aged Insomniac Women. Hence, Yogic practices are beneficial for aged insomniac women to maintain their overall wellbeing.

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