

Effect of Yogic Practices on Selected Bio-Chemical and Hormonal Variables among Stressed Working Women

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Abstract

The purpose of the study was to find out the effect of yogic practices on selected bio-chemical and hormonal variables such as fasting blood sugar and cortisol among stressed working women. In this study, 30 stressed working women from Chennai aged between 35 and 45 were selected randomly and divided into two groups equally. The experimental group underwent yogic practices for 45–60 min for 6 days a week for 8 weeks. The control group was in active rest and underwent their normal lifestyle. The data on bio-chemical and hormonal parameters were collected from both groups prior to training and after 8 weeks of yogic practices. Analysis of covariance (ANCOVA) was used to find out the significant difference between experimental and control groups. The level of significance was fixed at 0.05%. The results of this study show that yogic practices significantly decreased fasting blood sugar and cortisol levels in the experimental group than the control group among the stressed working women.

Keywords: Stress, Yoga, Fasting blood sugar, Cortisol, Working women

Introduction

A study by the Government of India shows that one out of every five Indians is suffering from a mental disorder. In fact, that places every family at severe risk of multiple issues such as chronic depression, suicidal tendencies and work-related stress. About 50% of corporate India is under chronic stress with 30% having problems such as addiction and marital discord, and 20% suffering from depression. A global survey of 2012 by the Regus Group revealed that over half (51%) of Indian respondents reported their stress levels to have risen compared to previous years. Work (51%) and personal finances (50%) were the contributing factors for the increased stress levels of the Indian workforce.

The effect of stress on the cerebral cortex, especially its psychic centre, can cause neuro-vascular changes in a given organ, which are responsible for the production of disease. If there is one method whose sole purpose is to restore the function of the cerebral cortex to normalcy either by reducing its activity or by enhancing it, it is yoga. Previous studies have demonstrated that yogic measures directly act on the production of neurohumours (Udupa and Prasad 2000). Hence yoga is one of the most efficient and scientific methods for the management of stress.

Purpose of the Study

The present study was designed to find out the effect of yogic practices on selected bio-chemical and hormonal variables such as fasting blood sugar and cortisol among stressed working women.

Hypothesis

It was hypothesized that there would be significant differences on the selected bio-chemical and hormonal variables such as fasting blood sugar and cortisol among stressed working women due to yogic practices than the control group.

Review of Related Literature

Chaturvedi et al. (2016) studied the effect of Hatha yoga therapy and regular physical exercise on the fasting blood sugar (FBS) and serum cortisol levels in perimenopausal women. This study recruited 216 women with perimenopausal symptoms, and 111 were assigned to the test group (Hatha yoga) and 105 to the control group (physical exercise). The duration of intervention was 45 minutes every day for 12 weeks. Blood samples were collected in the pre- and post-intervention period. Statistical significance was defined as $p < 0.05$. FBS ($p \leq 0.05$) showed a significant decrease after yoga therapy. Cortisol levels significantly ($p \leq 0.05$) increased in the post-intervention period in the control group. However, the cortisol levels remained the same in the test group between the two time periods. The study concluded that exercise maintains the sugar levels but the yoga practice helped in relieving the stress and enhancing overall health in perimenopausal women.

Naveen et al. (2016) examined the association between serum brain derived neurotrophic factor (BDNF) and cortisol levels in drug-naïve patients with depression treated with antidepressants, yoga therapy and both. Fifty-four drug-naïve consenting adult outpatients with major depression (32 males) received antidepressants only ($n = 16$), yoga therapy only ($n = 19$), or yoga with antidepressants ($n = 19$). Serum BDNF and cortisol levels were obtained before and after three months using a sandwich ELISA method. One-way ANOVA, chi-square test, and Pearson's correlation tests were used for analysis. The groups were comparable at baseline on most parameters. Significant improvement in depression scores and serum BDNF levels, and reduction in serum cortisol in the yoga groups, have been described in previous reports. A significant negative correlation was observed between change in BDNF (pre-post) and cortisol (pre-

post) levels in the yoga-only group ($r = -0.59$, $p = 0.008$). In conclusion, the study concludes that yoga may facilitate neuroplasticity through stress reduction in depressed patients.

Methodology

For the purpose of the study, 30 stressed working women from Chennai city aged between 35 and 45 were selected randomly. They were equally divided into two groups: experimental group (yogic practices group; $n = 15$) and control group (no intervention; $n = 15$). The experimental group was involved in yogic practices for the duration of eight weeks. The control group was in active rest during the period of the study. This study employed the experimental random group design, with yogic practices as the independent variables and fasting blood sugar and cortisol as the dependent variables.

Yogic practices such as suryanamaskar, asanas, pranayama and Yoga Nidra were given to the experimental group for a period of eight weeks. The training scheduling comprised of six days per week for 45 to 60 min in the mornings for eight weeks. The data were collected before training as pre-test from both groups. After eight weeks of yogic training, data were again collected from both the experimental and control groups. Fasting blood sugar (mg/dL) was measured by the blood glucose test in a laboratory. Cortisol (mcg/dL) was measured by cortisol blood test in a laboratory.

Analysis of covariance (ANCOVA) was used to find out the significant differences among the groups. The level of significance was fixed at 0.05%.

Results and Discussion

Fasting blood sugar

The results of the effect of yogic practices on fasting blood sugar among the experimental group and the pre-, post- and adjusted posttest mean of the experimental and control groups are presented in Table I.

Table-I

Computation of mean and analysis of covariance of fasting blood sugar (scores in mg/dL) of the experimental and control groups

	Experi mental group	Contro l group	Source of varianc e	Sum of squares	Degr ees of freed om	Mean squares	Obtai ned F ratio
Pretest mean	111.13	103.27	Between	464.13	1	464.13	1.72
			Within	7562.67	28	270.10	
Posttest mean	98.40	108.00	Between	691.20	1	691.20	4.86*
			Within	3983.60	28	142.27	
Adjusted posttest mean	96.10	110.30	Between	1424.01	1	1424.01	27.42 *
			Within	1402.43	27	51.94	
Mean differenc e	12.73	4.73					

*Significant at .05 level of confidence. (The table value for significance at .05 level of confidence with df 1 and 28 is 4.20 and for df 1 and 27 is 4.21.)

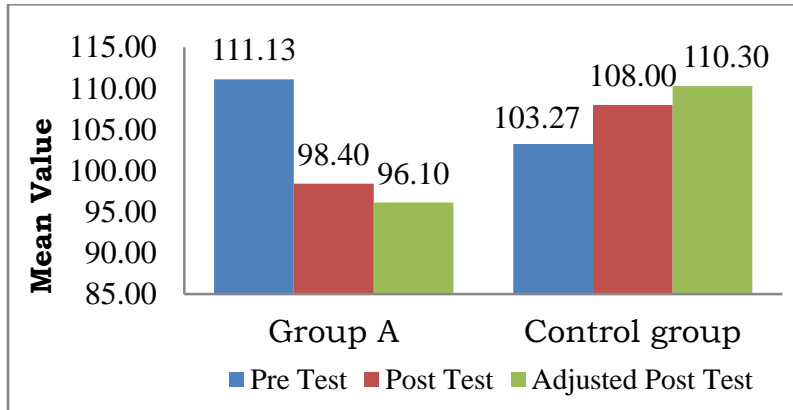
Table I shows that the pretest mean score of fasting blood sugar of the experimental group is 111.13 and that of control group is 103.27. The posttest mean of experimental and control groups are 98.40 and 108.00, respectively. The pretest obtained F value of 1.72 is lesser than the required F value of 4.20 to be significant at .05 level of confidence. This proved that there was no significant difference between the groups at the initial stage and the randomization at the initial stage was equal.

The posttest score analysis shows that there is significant difference between the groups as the obtained F value of 4.86 is greater than the required F values of 4.20. This proves that the difference between the posttest mean of the subjects is significant.

Taking into consideration the pre- and posttest scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of 27.42 is greater than the required F value of 4.21. This proves that there is significant difference between the means due to eight weeks of yogic practices on the variable of fasting blood sugar. The obtained adjusted mean values are presented through bar diagram in Figure 1.

Figure-1

Adjusted Posttest Values of Fasting Blood Sugar of the Experimental and Control Groups Cortisol



The results of the effect of yogic practices on cortisol among the experimental group and the pre-, post- and adjusted posttest mean of the experimental and control groups are presented in Table II.

Table-II

Computation of Mean and Analysis of Covariance of Cortisol (scores in mcg/dL) of Experimental and Control Groups

	Experim ental group	Cont rol grou p	Source of varianc e	Sum of squares	Degre es of freed om	Mean squares	Obtai ned F ratio
Pretest mean	13.82	11.76	Between	32.01	1	32.01	1.88
			Within	476.93	28	17.03	
Posttest mean	10.81	14.03	Between	77.47	1	77.47	5.5*
			Within	394.33	28	14.08	
Adjusted posttest mean	10.08	14.76	Between	154.02	1	154.02	27.04 *
			Within	153.78	27	5.70	
Mean difference	3.01	2.27					

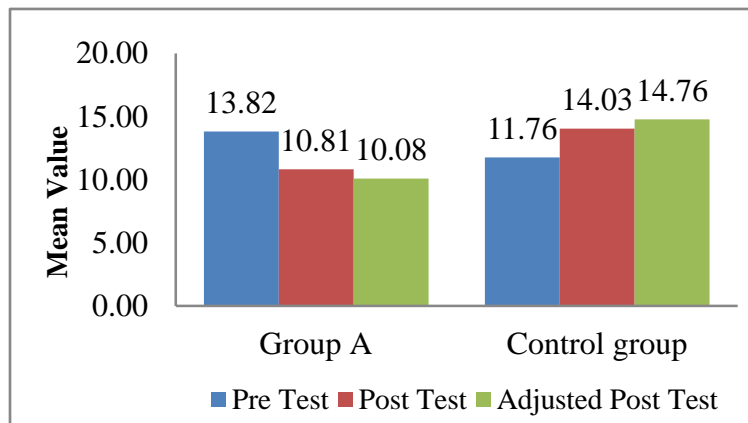
*Significant at .05 level of confidence. (The table value for significance at .05 level of confidence with df 1 and 28 is 4.20 and for df 1 and 27 is 4.21)

Table II shows that the pretest mean score of cortisol of the experimental group is 13.82 and that of control group is 11.76. The posttest means of experimental and control groups are 10.81 and 14.03, respectively. The pretest obtained F value of 1.88 is lesser than the required F value of 4.20 to be significant at 0.05 level of confidence. This proved that there was no significant difference between the groups at the initial stage and the randomization at the initial stage was equal.

The posttest score analysis shows that there is significant difference between the groups as the obtained F value of 5.5 is greater than the required F values of 4.20. This proves that the difference between the posttest mean of the subjects is significant.

Taking into consideration the pre- and posttest scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value of 27.04 is greater than the required F value of 4.21. This proves that there is significant difference between the means due to eight weeks of yogic practices on the variable of cortisol. The obtained adjusted mean values are presented through bar diagram in Figure 2.

Figure-2
Adjusted Posttest Values of Cortisol of the Control and Experimental Groups



Conclusion

The eight weeks of yogic practices significantly decreased the fasting blood sugar and cortisol levels in the posttest data of experimental group, compared to the control group. By proving the effect of yogic practices on bio-

chemical and hormonal variables, this study adds weight to the argument that yogic practices offer an excellent solution to women who suffer from stress.

References

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