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YOGIC PRACTISES' EFFECT ON LIFE STRESS AND BLOOD GLUCOSE LEVELS IN HIGHLY STRESSED STUDENTS

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ABSTRACT
This study sought to determine the effects of yoga practise on students' blood glucose and stress levels. A randomised controlled trial was used to perform the investigation. A random sample of thirty undergraduate students was used to create two groups: fifteen were assigned to the practises group and fifteen to the control group. For a duration of 12 weeks, the yoga poses were performed once a week for 60 minutes. It combined physical exercises like surya namaskara with relaxation techniques like yoga nidra and shavasana for meditation. A digital glucometer was used to measure postprandial blood glucose levels, and life stress was measured using the Life Stress Scale for Students. The practises group had significantly reduced postprandial blood glucose levels and life stress as compared to the control group. These findings imply that yoga can assist students in reducing stress in their lives and lowering their blood sugar levels after meals.

Keywords: digital glucometer, postprandial blood glucose levels

1. INTRODUCTION
Students today experience a tremendous deal of stress in higher education, and their courses are also a burden. Stress that begins at an early age develops into a long-term issue. Academic expectations, an unclear future, tests, interpersonal relationships with peers and teachers, parents' financial situation, and other adolescent concerns are all common sources of stress for students. As a result, students are under a lot of pressure. Stress is described as the body's non-specific responses to any adverse stimulus, and it's linked to increased sympathetic nerve activity, higher energy expenditure, and changes in heart rate, respiration rate, and blood pressure. Stress reduces the metabolic burden on homeostatic systems, but it also raises resting metabolic rate, leading to the development of metabolic syndrome.

The metabolic syndrome, often known as the X-Syndrome, is characterized by a group of symptoms including abdominal obesity, poor glucose tolerance, dyslipidemia, and hypertension. The metabolic syndrome raises your risk of heart disease and type 2 diabetes. Metabolic syndrome is becoming more common in the general population, owing to a lack of physical practices combined with a high energy consumption, as well as poor diet, stress, and psychosocial variables. A lifestyle intervention program should be used to prevent and treat metabolic syndrome. Yoga is an important part in managing and treating metabolic syndrome.

Yoga is the oldest recognized science of self-development since it allows you to regulate your mind, body, and soul. It originated in India thousands of years ago. This union is accomplished via the practice and mastery of asanas (physical postures), pranayama (breathing techniques), and meditation. Yoga is a way of life for many people. There are several modern Hatha Yoga schools, each with its unique emphasis on the relative substance of physical postures, breathing methods, profound relaxation, and meditation practices.

In addition, yogic practices affects pancreatic secretion directly by rejuvenating pancreatic cells through alternate abdominal contractions and relaxation, and yogic practices lowers blood glucose levels due to muscular exertion and relaxation. Yoga asanas are thought to regenerate pancreatic cells, improve insulin secretion, and thereby rectify decreased insulin secretion in chronic diabetes. Finally, yoga practice has been shown to affect an individual's mental balance by reducing anxiety and stress and promoting hormonal balance and emotions of well-being.

Yoga intervention has been shown to be effective in reducing stress and promoting overall well-being in medical students in previous studies. Despite its well-known good benefits on physical and psychological characteristics, no studies on yogic programs to manage students' life stress have been done. As a result, the goal of this randomized controlled experiment was to see if yogic activities affected life stress and physiological stress markers such blood glucose levels in students.

2. OBJECTIVES OF THE STUDY
1. To identify and organize college students who are prone to stress.
2. To determine if there is a problem with glucose tolerance and high blood pressure

3. METHODOLOGY
A randomized controlled trial was used in this study. The participants in this study were 30 healthy female undergraduate students between the ages of 20 and

23, with no medical conditions, no history of drug misuse, and no prior yoga experience. Participants with a family history of diabetes were not allowed to participate in the study. Our department's Internet webpage was used to attract participants. All of the participants were students who volunteered their time. All participants were given thorough information about the study's objective and utility, as well as a written consent form. After signing the informed permission form, the participants were randomly assigned to one of two groups: yoga practices (n=15) or control group (n=15) using a random permuted block design and a random number table. Twenty-seven subjects, 12 in the yoga practice group and 15 in the control group, completed the full study. Due to personal reasons, three subjects withdrew out of the study before the posttest. Pretest data included demographic information, the Life Stress Scale, and postprandial blood glucose levels. Posttest data included the Life Stress Scale and postprandial blood glucose levels.

The Life Stress Scale for College Students was used to assess life stress. This test comprised of 50 items evaluated on a 4-point Likert scale (0=never, 3=extremely often) that measured sources of life stress in eight subscales: economics, lover, professor, family, future, values, grades, and friends. A higher score implies that you are more stressed than usual. The Life Stress Scale has an internal consistency of 0.95 in this study (Cronbach's alpha). Postprandial blood glucose levels were examined as a stress-related biomarker after participants completed Life Stress Scale surveys. The subjects' measurements were taken before the trial began and after the yoga intervention was completed. A digital glucometer was used to assess postprandial blood glucose levels.

For 12 weeks, yogic activities were done once a week for around an hour. Because there is scientific research on this sort of yoga, cyclic form yoga practicess were chosen. Surya namaskara and yoga nidra are examples of cyclic yoga practicess. Sun salutations, or Surya namaskara, are a kind of yoga that consists of 12 postures and breathing Practices. Also known as "psychic slumber," yoga nidra is a type of yoga that combines relaxation and meditation. The following practices were included in the cyclic yoga practiced in this study. After practicing 10 cycles of surya namaskara for 20 minutes under the instruction and supervision of the yoga expert, the subjects relaxed for 5 minutes in the shavasana stance. Finally, the participants did yoga nidra. In the shavasana stance, yoga nidra is practiced. Resolve, rotation of consciousness, mindfulness of the breath, feeling and sensation, visualization, and ending the practices with resolve are some of the phases.

The SAS program for Windows was used to conduct statistical analysis. All data is presented as a mean standard deviation. The homogeneity of demographic and clinical characteristics between the practices and control groups was tested using a t test. Unpaired t tests were used to evaluate whether there were significant differences between groups. Using paired t tests, significant differences across groups were determined. A probability value of less than 0.05 was regarded to be statistically significant.

4. RESULTS

There were no significant age differences between the yoga and control groups. The pre-intervention Life Stress Scale score and pre-intervention postprandial blood glucose level did not differ significantly between the two groups.

TABLE-1: AGE, LIFE STRESS, AND BLOOD GLUCOSE LEVEL HOMOGENEITY TEST BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS

Sno.	VARIABLES	EXPERIMENTAL GROUP	CONTROL GROUP
1	Age (years)	22.0 ± 0.3	22.0 ± 0.4
2	Economy	1.7 ± 0.7	1.9 ± 0.7
3	Lover	1.4 ± 0.5	1.6 ± 0.6
4	Faculty	1.3 ± 0.9	1.4 ± 0.9
5	Family	1.4 ± 0.6	1.3 ± 0.6
6	Future	2.1 ± 0.6	1.10 ± 0.4
7	Value	1.9 ± 0.8	1.10 ± 0.6
8	Grades	2.5 ± 0.5	2.4 ± 0.6
9	Friend	1.4 ± 0.6	1.3 ± 0.5
10	PPG (mg/dl)	91.0 ± 11.7	89.8 ± 9.9
11	Life stress (score)	1.7 ± 0.5	1.8 ± 0.5

TABLE-2: EFFECTS OF YOGA PRACTICESS ON LIFE STRESS AND BLOOD GLUCOSE LEVELS

Sno.	VARIABLES	GROUP	PRE TEST	POST TEST	DIFFERENCE
	Life stress (score)	Yoga	1.7 ± 0.4	0.8 ± 0.5***	−0.9 ± 0.7***
		Control	1.7 ± 0.4	1.8 ± 0.3	0.2 ± 0.4
	Economy	Yoga	1.7 ± 0.6	0.7 ± 0.6***	−1.2 ± 0.7***

		Control	1.8 ± 0.6	1.9 ± 0.6	0.3 ± 0.6
	Lover	Yoga	1.3 ± 0.5	0.6 ± 0.6**	−0.8 ± 0.8**
		Control	1.5 ± 0.5	1.6 ± 0.7	0.3 ± 0.8
	Faculty	Yoga	1.2 ± 0.8	0.2 ± 0.3***	−1.3 ± 0.8
		Control	1.3 ± 0.9	0.7 ± 0.8	−0.7 ± 1.3
	Family	Yoga	1.3 ± 0.4	0.6 ± 0.6**	−0.8 ± 0.8***
		Control	1.3 ± 0.5	1.5 ± 0.5	0.3 ± 0.6
	Future	Yoga	2.2 ± 0.4	1.2 ± 0.8**	−0.9 ± 0.9***
		Control	1.9 ± 0.4	2.2 ± 0.4	0.4 ± 0.6
	Value	Yoga	1.9 ± 0.6	0.8 ± 0.7***	−1.3 ± 0.9***
		Control	1.10 ± 0.6	2.3 ±	0.4 ± 0.9
				0.4	
	Grades	Yoga	2.5 ± 0.5	1.7 ± 0.8*	−0.9 ± 0.9***
		Control	2.3 ± 0.6	2.7 ± 0.4	0.5 ± 0.7
	Friend	Yoga	1.3 ± 0.4	0.7 ± 0.6**	−0.8 ± 0.8***
		Control	1.2 ± 0.4	1.3 ± 0.4	0.3 ± 0.5
	PPG (mg/dl)	Yoga	92.0 ± 11.5	82.5 ± 8.8**	−8.9 ± 7.7***
		Control	90.5 ± 9.9	104.5 ± 8.3**	14.9 ± 13.9

***p<0.05; **p<0.01; ***p<0.001; PPG: postprandial blood glu-cose level, SD: standard deviation**

The Life Stress Score differed significantly between the two groups (yoga vs. control, p0.001), as well as over time (pretest vs. posttest, p0.001). The mean post-intervention Life Stress score (mean SD, 0.8 ± 0.5) for the yoga group was considerably lower than the mean pre-intervention Life Stress score (mean SD, 1.7 ± 0.4). The grades subscale had the highest score among the Life Stress subscales. Following the yogic activities, the yoga group's Life Stress subscale scores for economy, partner, family, future, values, grades, and friends all fell dramatically. The difference in postprandial blood glucose levels between the two groups (yoga group vs. control group, p0.001) and across time (pretest vs. posttest, p0.05) was significant. When compared to the mean pre-intervention postprandial blood glucose level (mean SD, 92.0 ± 11.5), the mean post-intervention postprandial blood glucose level (mean SD, 82.5 ± 8.8) was significantly lower in the yoga group. The mean post-intervention postprandial blood glucose level (mean SD, 104.5 ± 8.3) in the control group was significantly higher than the mean pre-intervention postprandial blood glucose level (mean SD, 90.5 ± 9.9).

5. DISCUSSION

According to the findings, following 12 weeks of yogic activities, Life Stress Scale ratings were much lower than before beginning yoga practice. Additionally, throughout the course of the 12-week period, students in the yoga practices group had a significant reduction in stress, whereas those in the control group experienced an increase in stress. These results are comparable to those of Simard and Henry, who discovered that Perceived Stress Scale values fell considerably from baseline to mid-term, with the benefit lasting until the end of the intervention. They studied the effects of a 16-week yoga intervention on the health of female medical students. They also mentioned that a yoga intervention could help medical students reduce stress and improve their overall well-being. Furthermore, Beets & Mitchell's findings revealed that, despite just being exposed to a short yoga program, acute alterations in mental health indicators such as stress were observed. Meanwhile, revealed that yoga can promote mental health and may be useful in the avoidance of psychosomatic symptoms in healthy women. As a result, they reported that 12 of the 17 studies showed favorable changes in stress-related psychological or physiological outcomes. The current study, like other studies, supports the notion that yoga practices can help nursing students reduce psychological disorders including stress.

The grades subscale obtained the highest score among the Life Stress subscales in this study. This finding contradicts the notion that academic concerns are a more significant source of stress in students. Many different types of interventions have been proposed over the last two decades to help nursing students cope with their stress. For stress based on academic obstacles in students, one researcher recently recommended biofeedback, humor, peer instructors, mentors, and mindfulness training interventions. However, no current research with a new generation of yoga activities to help lower nursing students' stress has been undertaken. Finally, these data imply that, despite having additional stresses and expectations from their academic conditions, students in the yoga practices group were able to control the same amount of stress across the 12-week period. It is critical for nurse educators to assist students in managing their stress in order to avoid further difficulties.

The postprandial blood glucose level was used as a biochemical stress indicator in this investigation. Because of the time of the yoga session and the participants' personal circumstances, fasting blood sugar levels could not be assessed. Every Thursday at 5 p.m., the yoga class began.

Postprandial blood glucose levels in the yoga group were considerably lower after 12 weeks of practice.. However, there is very little data on the effect of yoga nidra (psychic sleep) and surya namaskara (sun salutations) on blood glucose levels in healthy persons. The results of this study back with Jensen, Stevens, and Kenny's conclusions that yoga nidra is linked to psycho-neuro-physiological parameters. Yoga has been demonstrated to have an immediate downregulating effect on both the pineal and hypothalamic-pituitary-adrenal axis responses to stress in a number of studies. Asana's performance boosted the sensitivity of the pancreas' B cells to the glucose signal. It also improved the sensitivity of the asanas' progressive long-term effect. As a result, it was discovered that brief yoga-based relaxation training normalizes the autonomic nerve system's functions. The findings of this study imply that yogic activities can improve stress and stress biomarkers in nursing students, as shown in earlier studies. However, more research is needed to assess the effect on stress biochemical indicators including cortisol and blood glucose in students. This is the first study that I am aware of that shows the effect of yoga practice on blood glucose levels in healthy students.

6. CONCLUSION

Students are more likely than other students to suffer from metabolic syndrome. Although the study did not examine food consumption, physical activity, or socioeconomic status, the prevalence was attributed to a sedentary lifestyle, high calorific or bad dietary habits, academic stress, an uncertain future, and a lack of attention to healthcare follow-up. The metabolic syndrome was significantly influenced by the training impact of Hatha yoga practices. Stress tolerance ability was raised by increasing the stress hormone cortisol level, as well as decreasing diastolic pressure, regulating impaired glucose tolerance.

The results show that after twelve weeks of yoga practices, the experimental group of stress prone students showed significant level differences in systolic blood pressure, diastolic blood pressure, fasting blood glucose, stress, and depression among stress prone students.

As a result of the training effect of yoga, it can be determined that metabolic syndrome is eased and well-being is achieved by managing stress and depression, thereby boosting the well-being of stress-prone college students.

7. RECOMMENDATIONS FOR FURTHER STUDY

- Yogic activities increased the ability for stress tolerance in this investigation. There are numerous stress-reduction techniques accessible. Autogenic training, biofeedback, Jocobson progressive relaxation, Imaginary relaxation, and the Suinn seven steps of relaxation are the techniques used. Any one of these

strategies, or a mix of these methods, together with yogic practices, should be used to reduce stress for better results.

- The test situations that a student may face were not considered in this study. Students may face a variety of pressures during examinations. As a result, the research can be expanded to look at students' stress levels before, during, and after exams.
- A similar study might be undertaken on students in the arts, sciences, commerce, and medicine to determine their proficiency in the selected factors.

8. REFERENCES

- Barnes VA, Davis HC, Murzynowski JB, Treiber FA. Impact of meditation on resting and ambulatory blood pressure and heart rate in youth. Psychosom Med. 2020; 66:909-14.
- Bhavanani AB, Madanmohan, Udupa K. Acute effect of Mukh bhastrika (a yogic bellows type breathing) on reaction time. Indian J Physiol Pharmacol. 2019;297- 300.
- Lloyd-Jones DM, Evans JC, Larson MG, O'Donnell CJ, Rocella EJ, Levy D. Differential control of systolic and diastolic blood pressure: Factors associated with lack of blood pressure control in the community. Hypertension. 2020; 36:594-599.
- Luskin FM, Newell KA, Griffith M, Holmes M, Telles S, Di Nucci E, et al. A review of mind/body therapies in the treatment of musculoskeletal disorders with implications for the elderly. Altern Ther Health Med. 2019; 6:46-56.
- Badsha H, Chhabra V, Leibman C, Mofti A, Ooi Kong K. The benefits of yoga for rheumatoid arthritis: Results of a preliminary, structured 8-week program. Rheumatology International. 2019; 29:1417-1421.
- Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Archives of General Psychiatry. 2018; 4:561-571.