Original Article

Effect of yoga on stress in women

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ABSTRACT

Background: Women are very anxious and constantly under stress to carry out responsibilities at home as well as at workplace. Yoga is considered to be one of the most important, effective and valuable tool available to overcome various psychological problems.

Aims: The study was aimed to find out the effect of yoga training on stress seen in women.

Material & Methods: The study was conducted at Yoga Institute of the Gujarat Ayurved University, Jamnagar after prior approval from Ethical Committee. Total 50 women working/non-working, aged 25-50 years, non-smoker, non-pregnant, having stress related symptoms but never undergone yogic training were enrolled and informed consent were obtained. Women doing daily exercises and having major medical/surgical illnesses were excluded. History, general and physical examinations, anthropometric data, vital data and stress assessment (done by Zung self-rated anxiety scale) of women were noted before & after 16 weeks of yoga training. Statistical analysis was done by paired-t test and values shown in mean ± SD.

Results: Out of total 50 women, 18 were working and 32 were non-working but doing household works. Anxiety scores before and after yoga training was found 47.04 ± 1.99 and 32.20 ± 4.72 respectively. The difference observed in anxiety score was statistically significant ($p<0.0001$).

Conclusion: Yoga helps to reduce stress and anxiety in working as well as non-working women. Practicing yoga daily improves the psychological functions significantly even in the absence of any other form of physical exercise.

Key words: Yoga, stress, working women, anxiety scale

INTRODUCTION

For centuries, women's have been expected to fulfill the ideal role of both perfect wife and mother, and this meant putting the family first before their own needs. Woman has to fulfill the demand at work followed by various demands at home. In today's scenario the husband and wife both work towards creating a balance between their working place and at home but it is still difficult for women as she has to play multiple roles of a cook, a family maid, a tutor, a nurse as well as cater to the demands of office work.

This can leave a working woman stressed and anxious; more so if the family is not supportive. Usually stress is experienced due to prolonged exposed to cold or heat, loss of blood, due to fear or any kind of diseases. The word 'stress' defined by the oxford dictionary as "a state of affair involving demand on physical or mental energy" [1, 2]. Stress is only harmful when it becomes overwhelming and interrupts the healthy state of equilibrium. Stress jacks up the nervous system, overburdens the adrenal glands and lowers immunity [3]. Stress causes an imbalance of the parasympathetic and sympathetic nervous system due to psychic stimuli which lead to disturbances of homeostasis in the body. Here comes the role of yoga which not only improves the physical stress but also the mental stress. It also helps in establishing equilibrium between the sympathetic and parasympathetic components [4]. Fewer studies have been carried out on women health problems generated due to stress, hence the present study is attempted to see the effect of yogic exercises and meditation on stress seen in women.

MATERIAL AND METHODS

The present study was conducted at Yoga Institute of Gujarat Ayurved University campus, Jamnagar, Gujarat during the period of May – August 2015

after obtaining ethical committee approval. Total 50 healthy female subjects aged between 25-50 years were enrolled for study. All the subjects had never undergone any kind of yoga training earlier. The women involved in professions like doctors, teachers, bank managers, clerk and also doing household work were selected. The informed consent was obtained from all the participants.
Exclusion and Inclusion criteria were based upon apparently normal health status as per following criteria

Inclusion Criteria:

1. Healthy non-smoker female.
2. Age: 25-50 years
3. Never undergone yoga training before joining this study
4. Subject is ready to perform and practices yoga.

Exclusion criteria:

1. History of daily exercise or physical training.
2. History of major medical illness such as tuberculosis, thyroid disorders, bronchial asthma, neuromuscular disorders
3. History of major surgery in the recent past, smoking, alcohol consumption.
4. Pregnant females.
5. Age < 25 years and >50 years.

All the data were collected at a fixed time of the day esp. between 5 p.m. -7p.m and 7 a.m. - 9 a.m. to minimize any diurnal variation in Physiology department, M. P. Shah Govt. Medical College, Jamnagar. Data on physical characteristics such as age, height, weight and body mass index (BMI) was obtained. BMI was calculated as weight (kg)/ height (m^2). All the subjects were received yoga training under the guidance of well-trained Yoga instructor for a period of 16 weeks for 1hour daily, 6 days a week between7:00 am to9:00 am and 4:00 pm to 7:00 pm at Yoga Institute. The subjects were informed about the procedures in brief and were asked to relax physically and mentally for 10 minutes. The yoga practice (1 hour-60 minutes) schedule consisted of Pranayama andAsana, which was concluded by meditation and prayer as follows:

Prayer	1 minute
Mild worm up exercise (Stretching exercise)	4 minutes
Surya Namaskar	15 minutes
Asanas: Shavasana, Naukasana, Halasana, Dhanurasana, Bhujangasana, Pavanmuktasana,	15 minutes
Pranayama:Nadi-sodhan, Bhastrika, Kapalbhati, BahyaPranayamAnulomVilom, Bhramari pranayama	20 minutes
Meditation on Omkar / laughing execrcise	5 minutes

History of the subjects was noted in brief as per Performa. The health of the subject was assessed by general and systemic examination after noting down the present, past, family and personal history. Vital parameters like radial pulse, blood pressure in right upper arm and respiratory rate were measured after 15 minutes rest in sitting position. All participants were experiencing mild level of stress, but had not diagnosed or received any treatment for psychiatric diseases.

A baseline record (which served as control) of respiratory rate (RR/min), pulse rate (PR/min), systolic blood pressure (SBP mmHg), diastolic blood pressure (DBP mmHg) were recorded within first 5 days of starting yoga in sitting position. SBP & DBP was measured by mercury sphygmomanometer (Diamond) on right upper arm and RR was recorded by observing abdominal wall movement in supine position after sufficient rest [5].The Zung Self-Rating Anxiety Scale (SAS)[6] was used to evaluate stress (anxiety) levels before and after yoga training.The scale focuses on the most common general anxiety disorders; coping with stress typically causes anxiety. There are 20 questions with 15 increasing anxiety level questions and 5 decreasing anxiety questions. There are two formats, self-evaluations and clinical evaluations, self –evaluation format used in present study. The Self-administered test has 20 questions. Each question is scored on a scale of 1-4 (none or a little of the time, some of the time, good part of the time, most of the time). There are fifteen questions worded toward increasing anxiety levels and five questions worded toward decreasing anxiety levels.

The scores range from 20-80

- 20-44 Normal Range
- 45-59 Mild to Moderate Anxiety Levels
- 60- 74 Marked to Severe Anxiety Levels
- 70- 80 Extreme Anxiety Levels

Statistical analysis was done by using Graph Pad Prism 5 software. All the values were shown in Mean ± SD. Paired t-test was used to see the effect of yoga training. $p<0.05$ was considered statistically significant, $p<0.01$ considered as highly significant.

RESULTS

Out of total 50 participants, 18 were workingwomen and 32 were non-working women.

The baseline characteristic of study is shown in table-1.

Table 1: Baseline characteristic of study population

Variables	Total(N=50)
Age (yrs.)	36.42±8.666
Weight (Kg)	59.28±7.948
Height (cm)	155.58±5.834
BMI (Kg/m2)	24.45±2.551

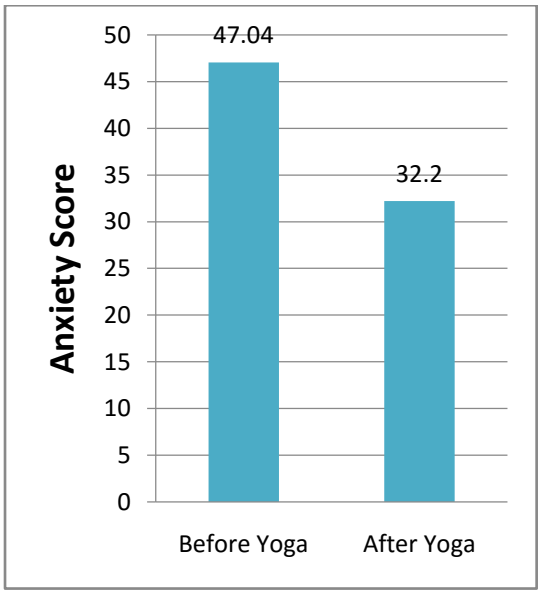
Table 2: Shows the comparison of anxiety scores in women before and after yoga training

Anxiety score before yoga training	Anxiety score after yoga training	't' value	'p' value
47.04 ± 1.99	32.20 ± 4.72	23.75	<0.0001*

*Statistically significant

Our study clearly showed significant difference in anxiety scores before and after yoga training (p<0.0001) which is graphically presented in fig. 1.

Fig. 1: Anxiety score before and after yoga training



DISCUSSION

It is clearly observed from table-2 and figure-1 that significant decrease in anxiety scores in women after practicing yoga training and meditation. This clearly demonstrates the beneficial effects of yoga on stress in women. Autonomic nervous system (ANS) controls all major functions of the body, smoothens the body responses to environmental changes, and coordinates body's responses to exercises and stress. ANS executes its functions through the sympathetic and parasympathetic system. Stress is known to modulate activity of autonomic nervous system as well as central nervous system. Sympathetic arousal resulting in increased catecholamines and cortisol levels mediated through the hypothalamic- pituitary-adrenal axis is the effect of increased stress & anxiety [3, 7]. Some of the symptoms of stress seen in women include fatigue, head, back, neck and shoulder aches, stomach problems, pain during and after menstrual cycles, feeling of being anxious, isolated, frustrated, irritated and difficulty in concentrating. Subtle discriminations at workplaces, family pressures and society demands add to these stresses in them [8]. Yoga training with meditation helps to reduce stress by stimulating limbic system. Upon stimulation limbic system diminishes cortical responsiveness & arousal which is involved in stress. Meditation and different yogasanas influences hypothalamus & ANS. The hypothalamus is extensively interconnected with limbic system. Its stimulation with subsequent stimulation of peripheral parasympathetic system leads to subjective sensation of relaxation, reduction in heart rate (HR) & respiratory rate (RR). Reduction in HR and RR sends signal to medulla which causes decreased stimulation of locus ceruleus. This results in decreased norepinephrine available to the hypothalamus which secretes less corticotrophin releasing hormone and ultimately decreases cortisol level [9]. In yoga, the crucial component is mind-body relaxation. The physical effect of stress is minimized by the influence of relaxation of mind on the body. Pranayama, yogasanas, meditation, relaxation, surrenders to the Divine bring the mind-body relaxation that balances sympatho-vagal output [10]. Other important mechanisms explain the role of yogic meditation in reducing anxiety are a) during meditation there is decrease in plasma phenylalanine that is associated with altered mental activity and also decrease in plasma cortisol which is an important mediator of stress b) Different yoga poses show an increase in the levels of central inhibitory neurotransmitters Gamma amino butyric acid (GABA) as low GABA levels are associated with higher anxiety [11, 12].Kurwale *et al*[13] and Gawali *et al* [3] reported the same findings observed in present study. The yoga practices stimulate and balance all systems of the body. The end result is increased mental clarity, emotional stability and a greater sense of wellbeing [14].

CONCLUSION

Our study concludes that regular practicing yoga decreases stress in working as well as in non-working women. It also helps to improve subjective feeling of wellbeing.

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