



Impact of Yoga Therapy in the management of Subjective Stress on selected Physiological and Biological measures in Females

KEYWORDS

Yoga Therapy, Stress, Blood Pressure, Pulse Rate

Annapoorna, K

Selection Grade Lecturer,
Department of Yoga, Kasturba
Medical College and Hospital,
Manipal University, Manipal-576104,
Karnataka

Latha, K.S

Professor & Psychosocial
Consultant Dr. AV Baliga Hospital.,
Udupi-576243, Karnataka

Vasantalaxmi, K

Selection Grade Lecturer,
Department of Physiology, Kasturba
Medical College and Hospital,
Manipal University, Manipal-576104
Karnataka

ABSTRACT *Stress related symptoms are manifested as somatic and psychological symptoms and commonly seen in medical settings which do not warrant any active intervention in terms of medication. In the present study twenty female subjects who volunteered and who had reported stress that manifested as anxiety, depression, headaches, sleeplessness, stomach upsets and other vague symptoms formed the sample of the study. They had been investigated for various medical disorders and found no abnormality and hence referred for yoga therapy. They were trained in yoga therapy. Pre assessment and post assessment was conducted before therapy and after one month follow up. Findings revealed that the physiological and biological measures such as blood pressure, pulse rate, respiratory rate, body weight in addition to subjective feelings of stress were found to be significantly decreased, also improvements in appetite and sleep, showing that routine practice might have long term implications in this fast stress ridden life.*

Introduction

Stress is a common condition, a response to a physical threat or psychological distress that generates a host of chemical and hormonal reactions in the body. The feeling of stress is a combination of our perception of events or situations and our body's physiological reaction. In essence, the body prepares to fight or flee, pumping more blood to the heart and muscles and shutting down all non-essential functions. Stress has become a common catchword in our society to indicate a host of difficulties, both as cause and effect. (Nagendra & Nagaratna, 2003). Stress can cause headaches, irritable bowel syndrome, eating disorder, allergies, insomnia, backaches, frequent cold and fatigue to diseases such as hypertension, asthma, diabetes, heart ailments and even cancer. Many studies suggest that about 70 per cent to 90 per cent of adults visit primary care physicians for stress-related problems. Yoga offers a good tool for stress management and relaxation. Left unchecked, stress can lead to a variety of health problems, including headache, insomnia, back pain, burnout, weight gain, anger and substance abuse. (Nagendra & Nagaratna, 2003)

A review of articles published in 1996, summarizes 21 studies on Yoga in modern medicine (Bhala, 1996) This review confirms that, "Yoga therapy seems to be of great value in asthma, cardiac patients, multiple sclerosis, migraine, rheumatoid arthritis and rehabilitation" These are conditions in which stress may play a part in the course of the disease (Sapolsky & Robert, 1998)

In a study on medical students conducted to determine the benefit of yogic practices on anxiety status during routine activities and prior to examination. Results indicated the beneficial role of yoga in not only causing reduction in baseline anxiety level but also attenuating the increase in anxiety score in stressful state such as examination. (Malati & Damodaran, 1999)

Yoga is the oldest defined practice of self development technique in existence. The methods of classical yoga, traditionally an eastern practice is now becoming popular world-wide. Many corporate sectors are realizing the positive benefits of yoga in overcoming stress, which thereby indirectly contributes to improved productivity, decreased rates of absenteeism, alcohol use/abuse, lesser accident rates and improve-

ment in the morale of the workers.

A decreasing quality of life, increasing health hazards, social unrest, student unrest, violence, substance abuse, terrorism and so on are all expressions of stress. The current mechanistic world view, the matter based approach, the increased dependence on science and technology and associated life styles have to under go basic changes towards embracing a more holistic world view and a healthier and more harmonious life style. Yoga is a science to calm the mind and steady the emotions by overcoming stress and attaining relaxation.

Yoga therapy is a practical discipline incorporating a wide variety of practices whose goal is the development of a state of mental and physical health, well being, inner harmony and ultimately a union of the human individual with the universal (Arabindo, 1999). Components of yoga therapy include the practice of physical postures (asana), regulation of respiration with a number of breathing techniques (pranayama), meditation techniques (dhyana), and relaxation techniques.

Practice of asana is steady and comfortable, which is practiced easily with proper relaxation of muscles with no efforts, without any tension in joints and also attention is focused on breathing. As mind remains engaged in breathing more relaxation of body and mind is attained. Practice of pranayama is control of breath by regulating inspiration and expiration. If the practice of rhythmic breathing is done with gradual, conscious, and equal prolongation of inhalations and exhalations then body will experience a sense of deep relaxation. Practice of repetition of similar objective thoughts in the mind is meditation or dhyana. As one pointed of mind is developed there will be increased alpha waves in the brain, improvement in mental clarity and perception, and increase in parasympathetic stimulations. Practice of relaxation techniques are useful in removing physical exertion and provide mental calmness resulting in total relaxation of body and mind and also hormonal imbalance is normalized. So practice of relaxation techniques is indicated in insomnia, anxiety, phobias and stress related disorders. (Bijaloni, 2004), (Gore, 1991), (Harisharananda & Mukherji, 1981), (Shah, 1999)

All yoga practices are parasympathetic in nature. In stress sympathetic activities are increased. Thus practice of yoga balances the functions of autonomic nervous system and en-

ocrine systems. Thus yoga develops the personality physically, mentally, emotionally from a holistic perspective offers a total and comprehensive approach to the challenges posed by stress. (Bijalani, 2004), (Gore, 1991)

Stress related symptoms which are manifested as somatic and psychological symptoms are commonly seen in all medical specialties which do not warrant any active intervention in terms of pharmacotherapy and thus are referred to some complementary or alternative care such as yoga, massage, physical exercise, and aerobics and so on. The subjects consulted medical departments and were latter referred for yoga therapy to be de-stressed and hence were taken up with the aim to find out the effect of the components of yoga therapy on their manifestations of stress.

Aims and Objectives

The aim of the present study was to evaluate the efficacy of yoga in stress conditions.

1. Effect of yoga therapy on physiological measures such as blood pressure, pulse rate and respiratory rate
2. Effect of yoga therapy on some biological parameters such as body weight, appetite and sleep.
3. Effect of yoga on 'subjective' feelings of stress

Materials and Method

Setting : Department of Yoga, KMC Hospital, Manipal.

20 female subjects volunteered who reported of subjective feelings of stress in addition to some symptoms of anxiety, depression, head ache, sleeplessness, stomach upsets and other vague complaints. All medical conditions had been ruled out by the physician whom they had consulted. They were neither practicing any form of yogic technique nor any form of physical exercise.

Written consents were taken and their baseline readings were taken.

1. Physiological measures.

- a. Systolic blood pressure and Diastolic blood pressure by using Sphygmomanometer.
- b. Pulse rate by using Pulse Oximetry.
- c. Respiratory rate manually

2. Biological measures.

- a. Body weight
- b. Appetite
- c. Sleep

All subjects were enquired 'Whether they were feeling tensed, anxious for no obvious or trivial reason and what they were experiencing', and was recorded.

All subjects underwent sessions of asana, pranayama, dhyana, relaxation training for 1 hour daily in the morning for 1 month under the guidance of the trained instructor. The training included the following practices. (Iyengar, 1988), (Shah, 1999)

- Swastikasana, Tadasana, Ardha Chandrasana, Pawanmuktasana, Bhujangasana, Shalabhasana, Padottanasana, Nadishodhana pranayama, Bhramari pranayama, Object dhyana, Makarasana, Shavasana

At the end of one month practice all parameters were measured and recorded. There were no drop outs.

Statistical analysis: All data were analyzed using descrip-

tive statistics. Baseline and final means was compared using Paired t test and underwent p-value analysis. P values < 0.05 were considered statistically significant.

Results

Table 1 About here

Distribution of Sociodemographic characteristics of the sample

Variable	Number(20)
Age(Years)	
< 20	3
21-30	9
31-40	6
>40	2
Religion	
Hindu	15
Christian	2
Muslim	3
Occupation	
Working	8
Student	7
Homemaker/housewife	5

Majority were in the age group of 21-30 years or 31- 40 years; Hindus and either working or students.

Table 2 About here

Distribution of Manifestations of Stress

Complaints*	Number
Headache	5
Tension/worries	8
Anxious	3
Low mood/depressed	5
Poor /excess appetite	7
Chest pain/body ache	6
Fatigue	6
Indigestion& stomach upsets	4
Disturbed/excess sleep	9
Worries about job	4

*Many reported more than one complaint

Table 2 and Figure 1 depicts the common signs of stress manifestations reported by the respondents in rank order were Disturbed/excess sleep-1; Tension/worries-2; Poor / excess appetite-3; Chest pain/body ache & Fatigue -4; Low mood/depressed & Headache-5; Indigestion & stomach upsets, worries about job-6 and feeling anxious-7

Figure 1 About here

Distribution of Manifestations of Stress

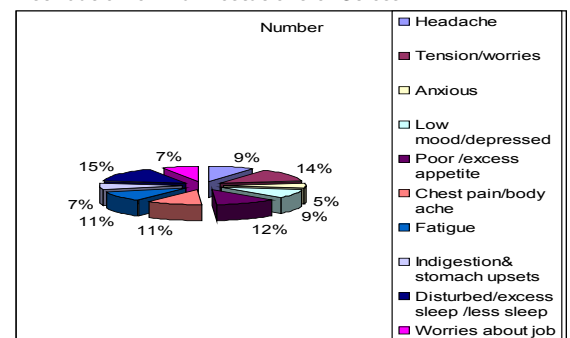


Table 3 About here

Physiological and biological measures

Parameter	Sample size	Before therapy	yoga	After yoga therapy	95% confidence interval		t	Significance
		Mean ±SD		Mean ±SD	Lower	Upper		
SBP	20	120.8±12.3 2.75*		112.5±6.35 1.42*	3.76	12.83	3.8	0.001

DBP	20	77.3±6.3 1.4*	70.2±4.39 0.98*	3.95	10.24	4.72	0.001
PR	20	77.6±7.18 1.6*	72.9±5.25 1.17*	1.86	7.63	3.45	0.003
RR	20	19.4±2.85 0.63*	18.25±3.41 0.76*	0.20	2.19	2.53	0.020
Wt	20	55.47±8.99 2.01*	54.0±8.79 1.96*	0.96	1.98	6.03	0.001

SBP – systolic blood pressure * < 0.05

DBP- diastolic blood pressure

PR- pulse rate

RR- respiratory rate

Wt-weight

Table 3 depicts the physiological parameters of the sample –the baseline and post assessment i.e. prior to starting the practice of yoga and 1 month after the training in yoga. As is evident from the table there was significant drop in mean blood pressure- SBP (120.8 S.D. ±12.3 to 112.5 S.D. ±6.35 mm Hg <0.05); DBP (77.6 S.D. ±6.3 to 72.2 S.D. ±4.39 mm Hg <0.05); pulse rate (77.6 S.D.±7.18 to 72.9 S.D. ±5.25/min <0.05); respiratory rate (19.4, S.D. ±2.85 to 18.3, S.D. 3.41<0.05), body weight (55.5 S.D. ±8.99 to 54.0 Kg S.D. ±8.79 <0.05) all of which were statistically significant. It was also evident that complaints such as anxiety, depression, head ache, sleeplessness, stomach upset due to stress were reduced. Also improvement in appetite and sleep indicating decreased sympathetic activity leading to reduction of stress were reported. All subjects also reported decrease in subjective feelings of stress.

Discussion

The purpose of this study was to determine the role of yoga training in modulating stress among normal female volunteers who reported on their own or referred by the physician for vague bodily symptoms and other stress related psychological symptoms. Yoga training for 30 days resulted in significant reductions in all physiological measures such as decrease in Systolic Blood Pressure, Diastolic Blood Pressure, Respiratory Rate, Pulse Rate and body weight all of which was statistically significant. Decreased systolic pressure can be attributed to yogic relaxation and meditation, which reduces the sympathetic action. During meditation the respiration becomes slow and shallow (Allison, 1970). The decrease in pulse rate can be attributed to the direct effect of sympathetic activity.

The effects of yoga as stress management which have been documented including parasympathetic nervous system activation which lowers the heart rate and the blood pressure thereby reducing the body's demand for oxygen. Other effects of yoga practices which have been documented include improving digestion, elimination and immune function, increasing the vital lung capacity and tidal volume; and reducing anxiety and depression.

Meditation is an age-old self-regulatory strategy, which is gaining more interest in mental health and psychiatry. Meditation can reduce arousal state and may ameliorate anxiety symptoms in various anxiety and stress related conditions.

Yoga therapy has never been very easy to define, largely owing to the depth and breadth of the subject. And yet, simply stated, yoga therapy could be called a system of health care that helps treat human indispositions as naturally as possible, to alleviate pain and suffering through set of exercises, both physical and mental. Ideally, yoga therapy is preventive in nature, as is yoga itself, while being curative in many instances, soothing in others, and restorative in most.

The practice of yoga is well-demonstrated to reduce the physical effects of stress on the body. People find that they feel more relaxed after practicing yoga. The physical postures of yoga are helpful for reducing muscular tension, which reduces stress. We have a tendency to store stress not only in our nervous system, but distributed throughout the musculature and other tissues of the body; our digestive system, for example, responds very quickly to stress. Yoga therapy can be a valuable and effective tool for releasing this stored stress.

Working with the breath can be a particularly effective method for treating a negative response to stress. When we are experiencing stress, our breathing tends to become shallow and rapid. Shallow and rapid breath further stimulates the body's stress response, and we can become caught up in an ineffective breathing pattern that only causes more stress. Many yoga techniques emphasize slowing and deepening the breath, which activates the body's parasympathetic system, or relaxation response. Thus just by changing our pattern of breathing, can significantly affect our body's experience of and response to stress. This may be one of the most profound lessons from yoga practice.

In the current world of increasing medication usage, more and more people are realizing that drugs are not always the best answer to their headaches and are looking for effective drug free solutions and the practice of yoga can be a better option available which is gaining popularity globally.

Stress affects people in a variety of ways, including emotionally, physically, and mentally. For children, excessive stress can interfere with their schoolwork and with peer, family, and interpersonal relationships (Paschall & Hubbard, 1998) During times of excessive and unmanageable stress, people, especially adolescents, respond with symptoms of anxiety, withdrawal, aggression, poor coping skills, drug and/or alcohol use and abuse, and physical illness (Rollin et.al, 2003) In addition, obesity, cardiovascular problems, asthma, and hypertension are the most prevalent physical disorders for children and adolescents who deal with stress (Ewart & Kolodner, 1992), (McQuaid et.al , 2000)

Although more clinical studies are needed to document the benefits of programs that combine pranayama (yogic breathing) asanas (yoga postures), and meditation, there is sufficient evidence to consider Yoga to be a beneficial, low-risk, low-cost adjunct to the treatment of stress, anxiety, post-traumatic stress disorder, depression, stress-related medical illnesses, substance abuse, and rehabilitation of criminal offenders. Yoga techniques enhance well-being, mood, attention, mental focus, and stress tolerance. Proper training by a skilled teacher and a 30-minute practice every day will maximize the benefits. Health care providers play a crucial role in encouraging patients to maintain their yoga practices.

Conclusion

Overall, the initial indications are an intensive but time-limited stress reduction intervention based on various components of yoga therapy can have long-term beneficial effects in the reductions of stress in persons experiencing stress related bodily, psychological symptoms and subjective perception of stress. This study suggests that yoga can be considered as a complementary therapy or an alternative method for medical therapy in the treatment of normal stress and other stress related conditions.

The present study had several limitations, such as 1. Sample size was small and included only females 2. Follow up period was one month only hence could not know whether the initial beneficial effects was lasting or maintained though the clients were instructed to practice it on regular basis.

REFERENCE

Allison, J "Respiratory Changes during Transcendental Meditation", *The Lancet*, 1970, pp 833-834. | Aurobindo S *The Synthesis of Yoga*. Pondicherry, India: Sri Aurobindo Ashram Publication Department, 5th Edition. 1999 | Bijalani RL *Getting introduced to Yoga. Understanding Medical Physiology*, 3 edition: 871-906. 2004 | Bhala, B. "Yoga in Modern Medicine", *Int J Alt Compl Med* 1996, pp 11-13 | Ewart, CK and Kolodner, KB, Diminished pulse pressure response to psychological stress: early precursor of essential hypertension? *Psychosom Med*, 1992 Vol 54, Issue 4 pp 436-446 | Gore, M.M. *Anatomy and physiology of yogic practices* Kanchan Prakashan, Kaivalyadhama, Lonavla pp 72-120, 1991 | Hariharananda, A Mukherji, P.N. *Yoga philosophy of Patanjali*. Albany: SUNY Press, Feuerstein, Georg. pp 3-7, 1981 | Iyengar BKS *Light on Yoga*. George Allen, Unwin Publishers Ltd, Australia. 1988 | Malati A, Damoder A. Stress due to exams in medical students--role of yoga *Ind J Physiol Pharmacol* 1999, Apr; 43(2): pp 218-24 | McQuaid, J. R., Monroe, S. M., Roberts, J. R., Kupfer, D. J., & Frank, E.O. A comparison of two life stress assessment approaches: Prospective prediction of treatment outcome in recurrent depression. *J Abn Psychol* 2000 109, pp 787-791. | Nagendra, H.R. Nagaratna, R. *New perspectives in stress management* 2nd ed. Vivekananda Kendra Prakashana, Bangalore pp 1-29, 2003 | Paschall, M, and Hubbard M. Effects of neighborhood and family stressors on African American adolescents' self-worth and propensity for violent behavior. *J Consult Clin Psycho* 1998, 66: pp 825-31. | Rollin, S.A., Arnold, A.R., Solomon, S., Rubin, R.I., Holland, J.L. *A stress management curriculum for at-risk youth* J *Humani Counsel* 2003. Education and Development | Sapolsky, Robert: *Why Zebras Don't Get Ulcers*, W.H. Freeman and Co., New York, 1998 | Shah, J.T. *Therapeutic yoga*. Vakils Feffer & Simons Pvt. Ltd. Mumbai, 1st Edition, 47, pp 95-99, 199