

STRESS DUE TO EXAMS IN MEDICAL STUDENTS – ROLE OF YOGA

A. MALATHI* AND A. DAMODARAN**

*Department of Physiology,
Lokmanya Tilak Municipal Medical College & General Hospital,
Sion, Mumbai – 400 022*

and

***Medical Division,
BARC, Mumbai*

(Received on May 18, 1998)

Abstract : A student under optimal stress does bring out his or her best, However extremes of stress can result in stress induced disorders and deteriorating performance. Can yoga be of benefit in stress induced effects in medical students? The present study was conducted in first MBBS students (n=50) to determine the benefit if any of yogic practices on anxiety status during routine activities and prior to examination. Feedback scores were assessed to determine how the students had benefited from the practices.

Anxiety status as assessed by Spillberger's anxiety scale showed a statistically significant reduction following practice. In addition the anxiety score which rose prior to exams showed a statistically significant reduction on the day of exam after practice. These results point to the beneficial role of yoga in not only causing reduction in basal anxiety level but also attenuating the increase in anxiety score in stressful state such as exams. The results of the exam indicated a statistically significant reduction in number of failures in yoga group as compared to the control group. The improvement in various parameters such as better sense of well being, feeling of relaxation, improved concentration, self confidence, improved efficiency, good interpersonal relationship, increased attentiveness, lowered irritability levels, and an optimistic outlook in life were some of the beneficial effects enjoyed by the yoga group indicated by feedback score.

Key words : stress anxiety yoga exam

INTRODUCTION

A vast majority of teenagers from medical colleges are undergoing psychiatric treatment which is a tip of the iceberg for there are many more who are not availing

of any psychiatric treatment in spite of behavioural problems, disturbed interpersonal relationships or deteriorating performance. Psychiatrists attribute this disturbing trend to stress created by competitive education systems. The modern

*Corresponding Author

youth is at cross-roads. On entering into the professional colleges the student is in a new challenging and stressful environment.

Factors contributing to high levels of stresses in professional colleges could be highly competitive curriculum, intense academic competition, excessive demands on coping abilities in physical, emotional, intellectual, financial and social terms. Possibly these and many more factors contribute to high levels of stress in medical students. With the above facts in mind the relevance of yoga in medical education was evaluated.

Apart from periodically and regularly releasing the accumulated stresses and tension which is essential to begin with, it is imperative to move towards a life with eustress retaining all the powers and capabilities obtained by a sensitive mind and a sharp intellect vital for day to day functioning in a highly competitive and stressful life of the student. "Working in relaxation" with total "Awareness in Action" would enable one to interact in the society judiciously and effectively (1).

In the ancient system of education various yogic practices like Suryanamaskar, Pranayama, meditation as well as good value systems were introduced with the formal education to enable the development of good physique, strong ethical values and good stress tolerance (2). A state of mental tranquility is achieved by the practice of yoga as revealed by increase in alpha index of electroencephalogram after short term yoga (2, 3). Yoga can protect the individual by bringing harmony between mind and

body, modulating stress responses and one's attitude to stress as also improving mental faculties such as attention, memory, learning efficiency and positive attitude to life (4, 5, 6).

Total growth of personality at physical, mental, intellectual and social level can result with the regular practice of yoga (6). At physical level regular practice of asanas, pranayama bestows a proportionate, flexible, normally relaxed body with an ability to withstand stress efficiently (7). At critical times necessary energy gets evoked to deal with the stressful state (1). A calm still mind can bring forth the best performance even when one is under stress states like exams as in the present study and helps in the development of one's personality. At intellectual level yoga can sharpen memory, concentration, decrease anxiety levels (6,7). At spiritual level yoga creates an awareness to look for happiness from within oneself and to be at peace with oneself. The following study was carried out in students of 1st MBBS to study the effects of short term yoga on anxiety score at the time of exams. Feedback was elicited from the students with the help of a proforma to know their attitude towards yoga and how it had benefited them.

METHODS

50 students of First MBBS, 18-19 yrs voluntarily participated in the study. None of them was suffering from any major medical or psychiatric illness and not undergone any yogic practices earlier. They were randomly divided into two groups-control and yoga groups.

The yoga group underwent the following program for 1 hour, thrice a week for 3 months namely

- a) Prayer ---1 min
- b) Sthithapragnyasan ---2 mins
- c) Ananas Talasan, Hastapadaasan, Utkatasan, Parvatasan, Sashankasan, Yogamudra, Uthitekapadasan, Uthited-wipadasan, Shalabhasan, Sulabhabhujangasan, Ushtrasan ---25 mins
- d) Anulomvilom, Ujjayi, Bhramari ---5 mins
- e) Yoganidra with visualisation ---20 mins
- f) Meditation on Onkar & Tratak ---5 mins
- g) Prayer & Stithapragnyasan ---2 mins

The various asanas were chosen to improve their concentration, coordination, memory, and attitudinal behaviour.

The control group were allowed to carry on with any work such as reading, writing etc. for 1 hour during the time the yoga group underwent the yoga practices.

1. *Spillberger's anxiety scale*: was used to determine the anxiety score of both groups (8). The anxiety score was determined on two occasions before and after the practice sessions as follows :-

Before practice :

- i. 1month before the exams which served as basal reading

- ii. On the day of exam to determine the anxiety state due to exam stress.

After practice :

- i. 1 month before the exams which served as the new basal reading
- ii. On the day of exam to determine the effect of practice sessions on the anxiety status at the time of exam.

Scores were compared in both groups before and after practice sessions using paired t test on both occasions. (Table I).

TABLE I: Mean anxiety score

Control group :-

<i>Time of measurement</i>	<i>Before sessions</i>	<i>After sessions</i>	<i>Significance</i>
One month before exam.	30.64±3.02	32.45±2.95	NS
On the day of exam	46.21±3.15	47.76±3.42	NS

Ns = Not significant

Control Group :-

<i>Time of measurement</i>	<i>Before sessions</i>	<i>After sessions</i>	<i>Significance</i>
One month before exam.	30.92±2.36	20.36±2.12	P<0.001
On the day of exam	46.75±2.82	30.84±2.45	P<0.001

2. *Feedback evaluation of the program :*

A subjective assessment of the sessions was done in the yoga group using a proforma in which 14 parameters were assessed. Each of these parameters was graded and score allotted (Table II)

TABLE II : Proforma for feedback (scores allotted) Answer every question honestly. Has the training in yoga made any change in the following parameters to you. Tick in the appropriate column.

Parameters	Increased or improved greatly	Moderate increased	No change	Moderate decrease	Decreased greatly
Sense of well being	+2	+1	0	-1	-2
Calm & relaxed feeling	+2	+1	0	-1	-2
Attention, concentration	+2	+1	0	-1	-2
Hrs required to feel fresh	-2	-1	0	+1	+2
Self confidence	+2	+1	0	-1	-2
Efficiency in any task	+2	+1	0	-1	-2
Irritability levels	-2	-1	0	+1	+2
Stamina	+2	+1	0	-1	-2
Tiredness	-2	-1	0	+1	+2
Appetite	+2	+1	0	-1	-2
Optimistic outlook in life	+2	+1	0	-1	-2
Headache, bodyache etc	-2	-1	0	+1	+2
Interpersonal relationship	+2	+1	0	-1	-2

Scores allotted for feedback score calculation is indicated.

Students were asked to tick against the column which was most appropriate as regards their experience and attitude for each of the parameters. The scores were totalled to determine the positive score. The number of students who have chosen a particular grade is expressed as percentage of students (Table III).

b) *Correlation of attendance with feedback score :*

Score as determined from the feedback evaluation proforma was compared with their attendance. As 40 sessions were conducted in all this was taken as 100% attendance. (Table IV)

TABLE III : Feedback score for various parameters expressed as % of participants.

Parameters	Increased or improved greatly %	Some what increased %	Remained same %	Some what decreased %	Decreased greatly %
Sense of well being	48	40	12	0	0
Feeling of relaxation & calmness	68	28	4	0	0
Ability to concentrate & attentiveness	52	40	8	0	0
No. of hours required to fee fresh	4	4	44	48	0
Self confidence	32	48	20	0	0
Efficiency in any task	40	52	8	0	0
Irritability levels	0	0	16	0	0
Stamina	36	48	16	0	0
Tiredness	4	4	16	64	12
Appetite	8	20	68	4	0
Optimistic outlook in life	30	52	28	0	0
Headache, bodyache etc	4	4	12	48	32
Interpersonal relationship	48	32	20	0	0

TABLE IV : Correlation between average attendance of yoga classes and average feedback score.

Total no. of classes conducted=40

Attendance (% of classes)	Average attendance (no. of classes)	Average Feedback score
90-100	38.4	22.8
80-90	33.6	18.2
70-80	28.5	11.5
<70	22.6	7.4

c) Performance in the exam as determined by number of failures of failures in control and yoga group was compared in both groups using chi sq test.

RESULTS

1. Spillbergers anxiety score : (Table I)

Before Practice

A month before exam (basal reading)

The mean anxiety score was 30.64 & 30.92 a month before exams in yoga & control groups respectively before the practice sessions.

On the day of exam :

The mean anxiety score rose to 46.21 and 46.75 in control and yoga group respectively indicating increased anxiety status at the time of exam in both groups.

After practice

A month before exam

The mean anxiety score reduced to 20.30 in yoga group which was statistically

significant ($P < 0.001$) as compared to the score prior to practice. There was no statistically significant change in the anxiety score in control group.

On the day of exam :

On the day of exam the mean anxiety score was 46.75 prior to yoga practice and 30.84 in yoga group following practice. The decrease in anxiety score at the time of exam was statistically significant. ($P < 0.001$) The mean anxiety score did not show statistically significant change in control group.

II. Feedback score

a) The effect of yogic practices on the different parameters have been shown. The number of students who have chosen a particular grade for a specific parameter is expressed as % (Table III)

b) There was direct correlation between the feedback score and average attendance of classes which indicates that when average attendance of classes is more then average feedback score is significantly high ($r = 0.97$, $P < 0.01$) (Table IV)

c) *Performance (Table V) :*

TABLE V : Number of failures before & after practice in Yoga and control group

N = 25

Group	Before	After	X ²
Control (N=25)	7 (28%)	11 (44%)	2.2*
Yoga (N=25)	8 (32%)	2 (8%)	4.5**

*Not significant ($P > 0.05$)** $P < 0.05$

The number of failures before and after in control group did not show statistically significant change ($P>0.05$) while in yoga group there was a statistically significant reduction in failures in exam following yogic practices ($P<0.05$).

DISCUSSION

Stress is known to modulate the activity of autonomic nervous system and central nervous system in a way so as to cope up with the stress to get adapted to it. Stress may be external (environmental), internal (emotions) or sometimes there may be combinations of both interacting with each other. (6, 7). In stressful states with preponderance of sympathetic activity, yogic asanas and pranayama can lead to a state of reduced sympathetic activity shifting the autonomic balance towards relative parasympathetic dominance (9, 10, 11).

The present study revealed a definite reduction in the anxiety score following yoga. In challenging situations such as exams no doubt a certain element of anxiety is beneficial as an individual performs best under optimal stress but beyond limits performance deteriorates. It is in such challenging situations that yoga is beneficial as seen in the present study wherein an optimal level of arousal did persist at the time of exam resulting in better performance as compared to control group with high levels of anxiety.

A high positive feedback score of yoga group with regard to the parameters such as sense of well being, feeling of relaxation, improved concentration, self confidence, improved efficiency, good interpersonal

relationship, increased attentiveness, lowered irritability levels, and an optimistic outlook in life are some of the beneficial effects enjoyed by the yoga group. Similar results have been shown by Schell et al (4). These are useful traits for success in any profession. As indicated by a positive correlation of positive score & attendance, regular practice of yoga would be useful. Since it was the first time yoga was introduced in the college we also determined whether the students enjoyed the yoga sessions. 95% thoroughly enjoyed the sessions while 5% enjoyed it to some extent. If given an opportunity to join yoga classes when arranged in future whether they would like to join the classes-there was an overwhelming response of 100%. Opinions expressed by the students regarding yoga-

- a) Should be a continuous on-going activity
- b) Yoga should be included as a part of the curriculum in theory.
- c) Should be started from the time of admission into professional colleges so as to benefit one in the long run.

Yoga with physical, emotional, mental, personality development and holistic understanding offers to cope with stressful states. To meet the modern lifestyle full of challenges, stress and tensions an all round personality development has become mandatory for the student. The aspect of relaxation and detachment is lacking in our education process and it is this new dimension that needs to be added to the curriculum. Thus yoga can be beneficial in achieving a tranquil state of mind during routine activities and yet providing the concentration and arousal essential in demanding or stressful situations like examinations.

REFERENCES

1. Nagendra HR, Nagaratna R. New perspectives in stress management. 3rd ed. Vivekananda Kendra Yoga Anusandhana Samathan. 1994
2. Udupa KN, Sing RN, Yadav RA. Certain studies on physiological and biochemical responses to the practice of hatha yoga in normal volunteers. *Ind J Med Res* 1973; 61: 237-244.
3. Selvamurthy W. Yoga for everyone : A Physiologist's view. *Souvenir, 2nd Congress of Asian and Oceanian Physiological Societies* 1990; 12-15.
4. Schell FJ, Allolio B, Schoneche OW. Physiological and psychological effect of Hatha yoga exercises in healthy women. *In J Psychosom* 1994; 41: 46-52.
5. Wood C. Mood changes and perceptions of vitality : a comparison of effects of relaxation, visualisation & yoga. *JR Soc Med* 1993; 86 (4): 254-58.
6. Udupa KN. Stress and its management by yoga 2nd ed. Narendra Prakash Jain, Delhi, 1985.
7. Brain and psychophysiology of stress. Eds. K.N. Sharma, W. Selvamurthy, and N. Battacharya. Indian Council of Medical Research 1983.
8. Spielberger CD, Gorsuch RL, Lushena RE. Manual for the state trait anxiety inventory (self evaluation questionnaire), Palo Alto California, Consulting Psychologists Press 1970.
9. Anantharaman V, Subramanyam S. Physiological benefits in Hatha yoga training. *The Yoga Review* 1983; 3: 9-24.
10. Joseph SK, Sridharan SKB, Patil ML, Kumaria, Selvamurthy W, Joseph NT, Nayar HS. Study of some physiological and biochemical parameters in subjects undergoing yogic training. *Ind J Med Res* 1981; 74: 120-124.
11. Selvamurthy W, Nayar HS, Joseph NT, Joseph S. Physiological effects of yogic practices. *NIMHANS J* 1983; 1: 71-80.