

# Impact of regular practice of yoga on Anxiety and Subjective sleep rating in novices

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## Abstract

**Background:** Good numbers of studies have been carried out to demonstrate the potential effect of yoga in improving the quality of sleep

**Aim:** The present study is aimed at assessing quality of sleep and anxiety following the regular practice of Yoga.

**Methods and Material:** All subjects were recruited from S-VYASA University, Bangalore who were undergoing Yoga Instructor Course (YIC) and interested to take part in the study. All of them were assessed in many occasion for State trait anxiety inventory (STAI) and Sleep rating diary (SR) in every alternate day.

**Results:** It was observed that time spent on the Bed from first to last (going to bed till getting up) significantly reduced on day 5 comparing with day 1. However, the subjective rating of the quality of sleep significantly increased in subsequent days, i. e., 9<sup>th</sup>, 11<sup>th</sup> and 13<sup>th</sup> days ( $p < 0.05$ ) of sleep.

**Conclusions:** The practice of yoga can bring about enhancing the quality of sleep subsequently.

**Key-words:** Regular practice of yoga, STAI, Sleep

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## BACKGROUND

Sleep plays an important role in maintaining the equilibrium of human psychosocial behavior. Sleep wake cycle is one of the biological rhythms, determined by circadian rhythm and some factors like physiological function of body and works schedule. It has been reported that stress and anxiety has a direct role to play with quality of sleep. Quite a good number of studies have clearly reported that anxiety can reduce the amount of sleep, both in quality and quantity. (Vera et al., 2009; Tekur, Nagarathna, Chametcha, Hankey, & Nagendra, 2012)

Short term stress can really become the cause for health hazards and stress can lead to complain such as headache, muscle tension and strain, blood pressure(Gura ST, 2002; Schneiderman N1, Ironson G,

2005), sleep problems (Hassmén P1, Koivula N, 2000). In contrary, long term stress can be lead severe fatigue and burnout (Leone, et al., 2011 and Wessely S, Sharpe M, 1998), anxiety and depression (C1, 2005; Netterstrøm, et al., 2008). The outcome is anxiety and stress that can be as result of sleep deprivation or they may become the cause for the sleep.

Physical exercise has been shown to effectively reduce stress and its related symptoms. Regular physical exercise decreases symptoms of anxiety and depression (McDonald, David G., Hodgdon, 1991; VS1., 2010 and VS1, 2010), as well as physical stress and anger. Physical exercise gives energy and the same time promote relaxation & better sleep (DiLorenzo, et al., 1999; Youngstedt SD1, O'Connor PJ and 1997), boost the

immune system (LaPerriere AR1, et al., 1990) and enhances cognitive and executive functions.

Many of the yoga techniques including the meditation technique have been found to be effective in improving the quality of sleep in young volunteers (Patra & Telles, 2010).

Although many studies have been carried out in this direction but there was need to monitor the different components of subjective sleep and anxiety. Therefore, the present study is aimed at assessing the effect of yoga practice in subjective sleep and anxiety in every alternate day.

## **Material and Methods**

### **Participants**

A sample size of ( $n = 73$ ) of seventy-three participants was calculated using G-power, fixing ' $\alpha$ ' as 0.05 and power of the study as 0.8 based on the previous studies (Manjunath & Telles, 2005). Participants who attended Yoga instructor course (YIC) in month of November, S-VYASA yoga university, Bangalore. The age of the current study was ranging from 18 to 55 years. The criteria to include the subjects were the subjects regular for Yoga training, positive health and keen in taking part in the research trial. Subjects having psychological disorders, female subjects during menstruation, having the habit of consuming alcohol and caffeinated beverages, on psychiatric medication and complications of psychiatric and neurological diseases were excluded for the study.

All the subjects were informed about the trial of the research and informed consent was obtained from each subject following the approval from Institutional Ethical committee. One group with multiple assessment design was adopted for the current study.

### **Assessments**

#### **STAI**

State Trait Anxiety Inventory (STAI-S): The outcome measure was assessment

of state anxiety levels. It is self-assess using a self-rated scale called Spielberger's State Anxiety Inventory (STAI; Form X-1). STAI is reliable, valid tool with a High degree of internal consistency with Cronbach's alpha 0.86 for total scores, average reliability coefficients were acceptable for both internal consistency and test-retest (Quek, Low, Razack, Loh, & Chua, 2004).

It includes separate measures of state anxiety and trait anxiety each consisting 20 items rated on a 4 point scale from 1 to 4 which range from 20 (minimum) to 80 (maximum). Form 'S' evaluates state anxiety that how subjects feels 'at this moment'. In India, its reliability and validity are well established for adult populations. State anxiety shows different emotional condition characterized by feelings of nervousness, tension, worries, and apprehension, and increased activity of autonomic nervous system (Mcdowell, Health, Scales, & York, 2006)

#### **Sleep diary**

A sleep diary is a record of an individual's sleeping and waking times with related information, usually over a period of several weeks. It is self-reported or can be recorded by a care-giver. The sleep diary, or sleep log, is a tool used by doctors and patients. It is a useful resource in the diagnosis and treatment of especially circadian rhythm sleep disorders, and in monitoring whether treatment of those and other sleep disorders is successful. A sleep diary can help make individuals more aware of the parameters affecting their sleep. Sleep diary was administered for seven days.

#### **Intervention**

The day for the intervention started at 5 am and ended at 8 pm though four hours of relaxation period was given at regular interval. The practices viz., Om meditation and chanting (30 minutes), Yoga practices (3 hours), Pranayama (1 hour), Cyclic meditation (1 hour), Lecture session (2

hours), Karma yoga (1 hour) and Devotional session (30 minutes) were included as part of Yoga training. All set of practices were included as the Yoga training was imparted to the participants with an integrated approach involving the operational tool for each layers of existence.

**Data extraction and analysis**

For calculation the score of STAI is responded marked no. 4 for a question the score was given as 1, for question no. 1,2,5,8,10,11,15,16,19,20,21,23,26,27,30,33,34,36,39. Similarly question no. 3,4,6,7,9,12, 13, 14,17,18,22,24,25,28,29,31,32,35,37,38,40 responded marked same score was given. The sleep diary which was used consists of eight items and each item was responded as ‘minutes’, ‘numbers’ and ‘hours’. Responses in the form of minutes, number and hours are used for analysis. At last the sum total of score for all question were taken in to consideration for analysis. Obtained scores of STAI and SR (sleep rating) of all participants were tabulated in Microsoft excel worksheet.

All the data were used for Normality. Since all data were distributed normally, ‘ANOVA’ test was used for analyzing the data. All data were analyzed using SPSS (version 20) statistical package..

**Results**

Anxiety and components of the sleep were monitored for all the participants

undergoing their yoga training for 30 days. So both the above mentioned variable viz. STAI and sleep rating questioners on 1<sup>st</sup>, 3<sup>rd</sup>, 7<sup>th</sup>, 9<sup>th</sup>, 11<sup>th</sup>, 13<sup>th</sup> days of the training. Day one of STAI (anxiety) was compared with the other days of the recordings. Similarly, every item of the sleep rating questioners of day one was compared with those items of other days of the recording.

**STAI**

While comparing the score of STAI of the 1<sup>st</sup> day with the 7<sup>th</sup> days of the recording, it was observed that there was a significant change (p<0.05) in anxiety following the yoga training on 7<sup>th</sup> day.

**Sleep rating**

When every item of the sleep rating questioners compared with the items of the other days, it was noticed that the time taken to fall asleep significantly reduced on day 11. Similarly number of awakening during the night significantly reduced from day 3 to day 13 comparing with day 1 (p<0.05). It was also observed that time spent on the bed from first to last (going to bed getting up) significantly reduced on day 5<sup>th</sup> comparing with day 1. However, the subjecting rating of the quality of sleep significantly increased in subsequent days, e.g.,-9<sup>th</sup>, 11<sup>th</sup> and 13<sup>th</sup> days (p<0.05). Mean, SD of the scores of STAI and Subjective sleep rating is cited in **Table-1**.

**Table 01**

Table showing Mean ± SD of STAI and Subjective sleep rating between Day 1 and 7

Sl. No.	Variables	Day 1	Day 3	Day 5	Day 7	Day 9	Day 11	Day 13
1.	<i>State Trait Anxiety Inventory</i>							
1.a	STAI	82.45 ± 16.8	80.08 ± 19.3	80.74 ± 18.2	78.36 ± 18.6	78.38 ± 19.8	79.34 ± 19.5	76.51 ± 20.5
2.	<i>Daily Sleep Diary</i>							
2.a	Sleep Rating	9.73 ± 1.3	10.02 ± 0.8	10.06 ± 0.6	10.16 ± 0.8	10.12 ± 0.7	10.16 ± 0.7	10.07 ± 0.6
2.b		25.12 ±	20.93 ± 19.9	20.99 ±	22.60 ±	17.27 ±	15.67 ±	16.92 ±

		22.8		27.8	31.8	21.8	16.1*	32.6
2.c		1.55	1.15	0.95	0.85	0.62	0.68	0.58
		±	±	±	±	±	±	±
2.d		1.5	1.6	1.3	1.0	0.8	0.9	0.8
		7.59	5.36	4.55	4.62	2.99	4.26	3.15
2.e		±	±	±	±	±	±	±
		13.8	11.2*	10.3*	10.3*	5.1*	14.5*	5.7*
2.f		4.40	4.34	4.34	4.35	4.40	4.49	4.59
		±	±	±	±	±	±	±
2.g		0.8	0.4	0.6	0.5	0.5	0.8	0.6
		4.63	4.51	4.49	4.55	4.61	4.70	4.70
2.h		±	±	±	±	±	±	±
		0.6	0.5	0.5	0.5	0.5	0.7	0.7
2.i		397.95	383.84	375.82	374.59	377.62	371.58	388.04
		±	±	±	±	±	±	±
2.j		65.2	59.9	54.5*	48.6	56.6	50.3	48.0
		3.32	3.56	3.60	3.67	3.80	3.74	3.93
2.k		±	±	±	±	±	±	±
		1.1	0.9	1.1	1.1	0.9	0.8	0.8

\* $p < 0.05$ , comparing items of the sleep rating and STAI from 1<sup>st</sup> day with other days, using ANOVA as statistical Test.

## Discussion

In the present study, the result clearly revealed that the number of awakening during night reduced and the quality of sleep significantly increased over days following the yoga training. Though many studies have been carried out in this direction but an attempt was made to monitor the anxiety and various components of sleep in every alternate day.

Comparing the results of the current study with the previous studies done using the yoga intervention, many findings were reported and couple of them have been highlighted here.

Previously Manjunath and Telles reported that six months of yogic practices of yogic program, in elderly involving physical posture, relaxation techniques, voluntarily regulating breathing and lectures of yoga philosophy improve sleep latency, sleep duration and feeling of being rested in morning (Manjunath & Telles, 2005). After couple of years Patra and Telles reported that subjects practicing cyclic meditation twice a day improved their slow wave sleep (deep sleep),

reduced the amount of dream sleep and number of awakenings per hour (Patra & Telles, 2010).

Yoga is a multi-component practice consisting of physical activity associated with specific posture, breathing exercises, specific philosophical lecture towards life. It has been shown to reduce anxiety level and physiological arousal. In addition to this the practice of yoga was found to be effective treatment on mood and stress reduction, Yogic practices was shown to improve cardio-respiratory performance, psychological profile and plasma melatonin level and significantly reduced systolic blood pressure and diastolic blood pressure. Furthermore, Yoga helps to improve the cardiovascular efficiency and homeostatic control of body and result in improvement in autonomic balance and over wellbeing (Cohen et al, 2004 & Pilkington et al, 2005).

With all the supporting evidences it is evident that practices of yoga including guided relaxation techniques might have contributed in improving the quality of sleep in the adults undergoing the practices of yoga techniques

## Conclusion

Therefore it was clearly observed that the yoga training improved the quality of sleep, reduced the number of awakening during the night and anxiety suggestive of better quality of sleep. This study was done for a suitable sample size of 73 participants and both male and female subjects were included become the part of this study, which were the strength of the

study. A good design with a control group and objective variables should have been introduced.

This study will help the people with complication of sleep in clinical setup, for demonstration better quality of sleep following the practice of Yoga. In future a suitable design may be adopted with objective variables viz. polysomnography and biochemical variables.

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