

## **Project Completion Report**

### **Title of the research project:**

**Influence of yoga on psychological stress of the practitioners**

### **Institution undertaking the study:**

Patanjali Yoga Research Centre, Kozhikode, Kerala, India

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### Introduction

Yoga improves our psychological / mental well being, prevents the onset of mental health conditions and reduces the effects of traumatic experiences. Practicing yoga can help in cultivating mindfulness. Baer et al (2006) defines mindfulness as bringing one's complete attention to the experiences occurring in the present moment in a nonjudgmental or accepting way. Research studies have consistently shown a positive relationship between trait mindfulness and psychological health (<https://examinedexistence.com/the-five-mental-and-psychological-benefits-of-yoga/>).

Psychological stress is used broadly to refer to the negative emotional, behavioral, and biological response to a perceived threat. Mindfulness is reported to reduce stress and its consequences. Mindfulness can lead to less intense stress responses (Baer et al, 2006).

In a national survey, over 85% of people who did yoga reported that it helped them relieve stress. Exercise is a very useful way to relieve stress, but yoga is different from spinning class or weight-lifting in that it powerfully combines both physical fitness with an underlying philosophy of self-compassion and awareness. One of the main concepts in yoga is being non-judgmental toward both yourself and others, which is a powerful tool for stress relief, since much of our stress comes from us being hard on ourselves or frustrated with others (<https://www.psychologytoday.com/us/blog/urban-survival/201512/yoga-stress>).

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A study was undertaken by Patanjali Yoga Research Centre, Kozhikode, Kerala, India during 2019 to analyze the influence of yoga on psychological stress of the practitioners. The details are given below.

### **Methodology adopted**

The study was conducted using an interview schedule among a random sample of 40 yoga practitioners of Patanjali Yoga Research Centre, Kozhikode. The interview schedule contained Perceived Stress Scale (Cohen et al, 1983), the respondent's age, sex and period of yoga practice.

The Perceived Stress Scale consists of 6 negative and 4 positive items which quantify stress. There were five point responses for each item, scored using the Likert equal interval method. The interview schedule elicited the responses of the yoga practitioners on the ten items both before and after practicing yoga. The data was analyzed statistically through student's *t* test, correlation and linear regression.

### **Results and Discussion**

Table 1 shows the mean stress score of 40 yoga practitioners before and after starting yoga practice. While 90 % of people have a score in the range of 21 to 39 only before the practice of yoga, the score profoundly increases to 62 to 92 for 90% of yoga practitioners after the practice of yoga (Table 1). A higher stress score indicates less stress. Hence, this result implies that after the practice of yoga, people are 1.35 to 1.95 times less stressed than before the practice of yoga

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Table1. Mean stress score of the respondents before and after starting yoga practice

Before starting yoga practice		After starting yoga practice	
Mean stress score*	Respondents (%)	Mean stress score*	Respondents (%)
13-20	10	44-58	10
21-39	90	62-92	90
Total	100	Total	100

\*Mean stress score indicates the average stress score of the 40 yoga practitioners, expressed as % of the maximum possible stress score of 50 in this study

It may be seen from Table 2 that the mean (average) stress score of the 40 yoga practitioners after practice of yoga is 36.03, when compared to the score of 28.05 before yoga practice, with statistically significant difference existing between the two scores. This indicates that after the practice of yoga, the people (respondents) get a score, which is about 28 % higher than before practicing yoga. This means less stress after yoga practice

Table 2. Statistical test of significance of the difference in stress score before and after practice of yoga

Details	Before starting yoga practice	After starting yoga practice
Mean stress score	28.05	36.03
Variance	29.51	29.13
Statistical <i>t</i> value	-6.59	
	Statistically significant at $p < 0.001$	

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Table 3 gives the data of the mean (average) stress scores of men and women. Women show a higher stress score of 37.14 than men (34.88), indicating that women experience less stress than men after the practice of yoga. However, the difference in the scores of men and women is near marginal statistical significance only, since the  $t$  value is significant at  $p < 0.20$  only (Table 3).

Table 3. Statistical test of significance of the difference in stress score of men and women

Details	Men	Women
Mean stress score	34.88	37.14
Variance	35.86	23.93
Statistical $t$ value	-1.29	
	Statistically significant at $p < 0.20$	

When comparing people with up to 2 years of yoga practice and 2-3 years of yoga practice, it can be made out from Table 4 that the latter category of yoga practitioners has a comparatively higher score than the former category, which is also different statistically. The influence of a higher period of yoga practice in reducing the level of stress is evident from this result.

Table 4. Statistical test of significance of the difference in stress score of people with different periods of yoga practice

Details	up to 2 years of yoga practice	2-3 years of yoga practice
Mean stress score	36.61	40.71
Variance	16.42	24.57
Statistical $t$ value	-1.99	
	Statistically significant at $p < 0.05$	

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Age of the respondents did not shown statistically significant influence on the stress scores of the yoga practitioners.

Table 5 shows the responses of the yoga practitioners to the ten items in the stress scale before and after the practice of yoga. It can be seen that for all the negative items in Table 5 (item no. 1, 2, 3, 6, 9 and 10), the percentage of yoga practitioners experiencing them fairly often as well as very often has drastically reduced after yoga practice, when compared to before yoga. This indicates that they are less stressed on account of these negative emotions after the practice of yoga.

Similarly, it can be seen from Table 5 that the percentage of yoga practitioners experiencing the positive items (item no. 4, 5, 7 and 8) fairly often as well as very often has increased very much after they started yoga practice, compared to before yoga practice. This implies that they have started experiencing more of positive emotions after the practice of yoga, which will ultimately contribute to less of stress for them.

The above findings logically explain the higher stress score obtained by the yoga practitioners after yoga practice (as shown in Table 2), indicating less psychological stress.

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Table 5. Responses of the yoga practitioners to positive and negative items in the stress scale

Item no. and details of items	Respondents reporting (%)			
	Before starting yoga practice		After starting yoga practice	
	Never and Almost never	Fairly often and Very often	Never and Almost never	Fairly often and Very often
1. Upset since something happened unexpectedly	10	55	40	10
2. Felt that you were unable to control the important things in your life	30	37.5	30	17.5
3. Felt nervous and stressed	20	50	47.5	10
4. Felt confident about your ability to handle your personal problems	22.5	37.5	17.5	77.5
5. Felt that things were going your way	30	30	22.5	67.5
6. Could not cope with all the things that you had to do	22.5	42.5	55	10
7. Able to control irritations in your life	32.5	30	7.5	75
8. Felt that you were on top of things	45	27.5	35	55
9. Been angry because of things that were outside your control	17.5	42.5	52.5	15
10. Felt that difficulties were piling up so high that you could not overcome them	37.5	40	55	12.5

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A small correlation ( $r$ ) value of 0.32 only exists between the score of the negative item 1 (upset since something happened unexpectedly) and the total stress score (Table 6). However, Table 1 shows a comparatively higher  $r$  value of 0.60 for negative item 6 (could not cope with all the things that you had to do) and 0.62 for negative item 9 (been angry because of things that were outside your control) with the total stress score.

For the negative stress item 1, only 40 % of the yoga practitioners give the responses –Never and almost never. However, a comparatively higher proportion of the yoga practitioners (55 %) have replied as - Never and almost never for the negative item 6, while 52.5 % have replied in this manner for the negative item 9. This may be the reason for the higher correlation ( $r$ ) values of 0.60 and 0.62 with the total stress score for these two negative items, when compared to the  $r$  value of 0.32 for the negative item 1 (Table 6).



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Table 6. Correlation between the score of items in the stress scale and total stress score after the practice of yoga

Correlation (r) value between item scores and total stress score after the practice of yoga										
Item in the stress scale										
r	1	2	3	4	5	6	7	8	9	10
	0.32	0.46	0.51	0.27	0.58	0.60	0.23	0.53	0.62	0.54

- 1- Upset since something happened unexpectedly
- 2- Felt that you were unable to control the important things in your life
- 3- Felt nervous and stressed
- 4- Felt confident about your ability to handle your personal problems
- 5- Felt that things were going your way
- 6- Could not cope with all the things that you had to do
- 7- Able to control irritations in your life
- 8- Felt that you were on top of things
- 9- Been angry because of things that were outside your control
- 10- Felt that difficulties were piling up so high that you could not overcome them

Statistical linear regression analysis of the scores of the ten items in the stress scale with the total stress score after the practice of yoga showed that the maximum contribution (83 % -  $R^2$  of 0.83) of item scores to the variation in the total stress scores of the 40 yoga practitioners is observed for items 1 to 5 (Table 7).

The data reveals that after the practice of yoga, for the negative stress items 1 to 3 namely, upset since something happened unexpectedly, felt unable to control the important things in your life, and felt nervous and stressed, only 10 to 15 % of respondents (people) have replied as fairly often and often. Again, for the positive item 4, namely, felt confident about the ability to handle personal problems, 70 % people report fairly often and often and 65 % report fairly often and often for the positive item 5, namely, felt that things are going my way. Such a favourable trend with respect to experiencing both the negative items and the positive items

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mentioned above (which indicate good mindset of the yoga practitioners) may be the reason why the scores of the five items in the stress scale are explaining a very high proportion (83%) of the variation in the stress score of the respondents after the practice of yoga, as shown in Table 7.

These results indicate the effect of yoga practice in reducing negative thoughts and promoting positive ones.

Table 7. Regression analysis of the scores of selected items with the total stress score after practice of yoga

Item No.	Mean score	Coefficient	Coefficient for the item is statistically significant at	R <sup>2</sup>
1	3.45	1.70	$p < 0.001$	0.83 - Statistically significant at $p < 0.001$
2	3.25	1.94	$p < 0.001$	
3	3.70	1.63	$p < 0.001$	
4	3.90	- 0.18	Not significant	
5	3.63	2.90	$p < 0.001$	

- 1- Upset since something happened unexpectedly
- 2- Felt that you were unable to control the important things in your life
- 3- Felt nervous and stressed
- 4- Felt confident about your ability to handle your personal problems
- 5- Felt that things were going your way

**Note:** R<sup>2</sup> value of 0.83 shown in the 5<sup>th</sup> column in Table 7 indicates that the scores of the five items shown below Table 7 significantly explain 83 % of the variation observed in the total stress score of the 40 yoga practitioners

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### Conclusions

1. After the practice of yoga, people are up to 1.95 times less psychologically stressed than what they were before they started practicing yoga
2. After starting yoga practice, people have obtained increased stress score of about 28 % than before practicing yoga, which indicates less stress after yoga practice
3. Women experience lower psychological stress than men after the practice of yoga
4. The influence of a higher period (2-3 Years) of yoga practice, when compared to up to 2 years of practice in reducing the level of stress is evident from this study
5. Age showed no statistically significant influence on the stress scores of the yoga practitioners
6. The percentage of yoga practitioners experiencing all the negative items in the stress scale (used in this study) fairly often as well as very often has drastically reduced after yoga practice, when compared to before yoga practice. This indicates that they are less stressed due to these negative emotions after the practice of yoga.
7. The percentage of yoga practitioners experiencing the positive items in the stress scale fairly often as well as very often have increased very much after they started yoga practice than before yoga practice. This implies that they have started

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experiencing more of positive emotions after the practice of yoga, which will ultimately contribute to less of stress for them

8. The results shown under 6 and 7 above explain the reason for the higher stress score obtained after practicing yoga, indicating less stress for the yoga practitioners

9. Statistical linear regression analysis of the scores of the ten items in the stress scale used in this study with the total stress score after practice of yoga showed that the maximum contribution (83 %) of item scores to the variation in the total stress scores of the 40 yoga practitioners is observed for the following five items in the scale:

- a. Upset since something happened unexpectedly
- b. Felt unable to control the important things in life
- c. Felt nervous and stressed
- d. Felt confident about ability to handle personal problems
- e. Felt that things are going my way

10. For the negative stress items a, b and c shown in the above paragraph, namely - upset since something happened unexpectedly, felt unable to control the important things in your life, and felt nervous and stressed, only 10 to 15 % of respondents have replied as fairly often and often after the practice of yoga. After yoga practice, for the positive item d shown in the above paragraph, namely - felt confident about the ability to handle personal problems, 70 % people report fairly often and often, and 65 % report fairly often and often for the positive item e shown in the above paragraph, namely - felt that things are going my way.

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This indicates the effect of yoga in reducing negative thoughts and promoting positive ones.

It will be useful for different yoga centres imparting yoga training to carry out studies on the influence of yoga / meditation etc. on various health parameters among the practitioners so that the information generated from these studies can be disseminated to people in order to make them understand the utility of practicing mind-body relaxation techniques such as yoga. A coordinated effort by various yoga centres in this line is also worth considering.

One of the main problems reported by some of the yoga practitioners is the lack of time as well as a feeling laziness to practice yoga daily for a period of one hour, which is the usual time required as per the yoga training being imparted by many of the yoga centres. In this context, it will be worthwhile for the yoga centres to impart yoga training of about 20 to 30 minutes involving relevant asanas, pranayama and a short period of relaxation.

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### References

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