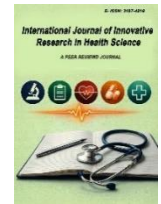


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### Research Article

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# A study to evaluate the effectiveness of kapalbhathi breathing technique on the level of stress and coping among IT professionals in selected IT companies, Puducherry.

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**Abstract:** **Introduction:** Stress is a growing concern among IT professionals due to demanding work environments, leading to adverse effects on mental health and coping ability. **Objectives:** The main objectives to evaluate the effectiveness of Kapalbhathi breathing technique in reducing stress and improving coping levels among IT professionals. **Methodology:** A quasi-experimental pretest- posttest control group, quantitative methodology was used. Purposive sampling was used in selecting 60 participants who were split into experimental (n=30) and control (n=30) groups. A Modified Workplace Stress Scale and Brief Resilient Coping Scale were used to gather baseline data on stress and coping. The experimental group was allowed to perform Kapalbhathi breathing practice of 15 minutes a day during 20 days whereas the control group received no intervention. The same tools were used to carry out posttest assessment. **Findings:** The statistical results showed that there was a significant reduction of stress levels and an increase of coping scores ( $p<0.001$ ) in experimental group and no significant increase of coping scores in control group. **Conclusion:** The research concludes that Kapalbhathi breathing technique is a simple, effective and non-invasive method of stress and coping management among IT professionals.

**Keywords:** Stress, Coping, Kapalbhathi breathing technique.

### INTRODUCTION.

Anxiety and depression are the most common mental health disorders and their occurrence is prevalent among the population of the world with stress being a major issue that is being constantly affected by work pressure, financial difficulties and relationship problems.

Workplace stress has been aggravated by the rapidity of globalization, job insecurities and technological change in the workplace, especially in the IT sector where employees are often subjected to long hours of work, deadlines, heavy performance demands, leading to both physical (fatigue, headaches, sleep disturbances) and psychological (anxiety, depression) problems.

Stress is a normal reaction to negative events, but over time and with the accumulation of stress, there are negative effects on both physical and mental health in the form of stress hormones and the development of lifestyle diseases such as hypertension and diabetes.

People resort to various coping mechanisms that can reduce or increase stress and uncontrolled stress can adversely affect the personal life, work performance and health in general. The technostress, which is brought about by constant technological use, also leads to reduced job satisfaction and commitment to the organization even more; particularly where young IT professionals face issues of work-life balance. Stress can be classified as eustress, distress, acute or chronic with chronic being the one with the highest health impact considering the long exposure.

Stress triggers physiologically the activation of the hypothalamic-pituitary-adrenal axis that results in hormonal changes that affect metabolism, immunity, and cardiovascular activity. There is some evidence that yoga and pranayama, particularly, Kapalbhathi breathing can be effective, simple, interventions that are effective in reducing stress, enhancing mental clarity, and improving health generally.

Thus, it is necessary to implement these practices to cope with increasing stress levels in IT professionals and to enhance health, productivity, and quality of life.

## OBJECTIVES

The main objective to evaluate the effectiveness of Kapalbhathi breathing technique on the level of stress and coping among IT Professionals in selected IT Companies in the experimental group.

## METHODOLOGY

### Study Design and Setting:

A quantitative approach with a quasi-experimental pretest–posttest control group design was adopted. The survey was done in selected IT firms in Puducherry by IT professionals.

### Participants and Sampling:

Purposive sampling was used to select 60 IT professionals (30 were in the experimental group and another 30 in the control group). Power analysis was used to determine the sample size taking into account attrition. Participants of both genders with mild to severe levels of stress and varying coping abilities were included. Individuals with severe stress requiring medical attention, prior exposure to yoga or stress management interventions, or significant medical conditions were excluded.

### Intervention (Kapalbhathi Breathing Technique):

The experimental group received Kapalbhathi breathing technique for 15 minutes daily over 20 consecutive days in a calm and comfortable setting. Each session followed a standardized protocol: participants were seated in a comfortable posture with an erect spine, hands on knees, and eyes closed, followed by relaxation and awareness of normal breathing. Sukha pranayama was practiced to enhance mental relaxation.

This was followed by rapid, forceful exhalations with passive inhalations using abdominal contractions. Participants were guided to observe passive inhalation, maintain rhythmic abdominal movements, and produce gentle exhalation sounds. After several cycles, relaxation and breath awareness were encouraged. The sequence was repeated with gradual depth, and sessions concluded with complete relaxation and internal awareness. The control group did not receive any intervention during the study period

Data were collected using a socio-demographic questionnaire, Modified Workplace Stress Scale, and Brief Resilient Coping Scale. Pretest assessment of stress and coping levels was conducted for both groups. The experimental group received the intervention during 20 days after which both groups were assessed using the same instruments during posttest assessment.

## Statistical Analysis:

Data was analyzed using descriptive statistics and inferential statistics.

## DISCUSSION

The research results demonstrated that the breathing method (Kapalbhathi) was useful to a great extent in terms of alleviating stress and enhancing coping among the professionals working in the IT sphere (the experimental group,  $p < 0.001$ ). Most of the respondents who were moderate (60.0) during pretest changed to fairly low stress (76.6) during posttest, and the control group remained the same. Demographic variables including habitant, educational status, and gender, and coping were significantly correlated with post-test stress, as well as with family monthly income.

## CONCLUSION

The study concluded that the Kapalbhathi breathing method is a good non-pharmacological method that helps in the reduction of stress and increase in the coping levels of IT professionals.

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**Table 4.1: Distribution of Demographic Variables among IT Professionals in Experimental and Control Groups (N = 60)**

Demographic Variables	Categories	Experimental Group (n=30) F (%)	Control Group (n=30) F (%)	$\chi^2$ , df, p-value
Age (years)	20–25	17 (56.7)	20 (66.7)	$\chi^2=5.043$ , df=2, p=0.080 (NS)
	26–30	13 (43.3)	7 (23.3)	
	31–35	0 (0)	3 (10.0)	
Gender	Male	23 (76.7)	19 (63.3)	$\chi^2=1.270$ , df=1, p=0.260 (NS)
	Female	7 (23.3)	11 (36.7)	
Habitant	Rural	9 (30.0)	8 (26.6)	$\chi^2=1.559$ , df=3, p=0.669 (NS)
	Urban	17 (56.7)	17 (56.7)	
	Semi-urban	3 (10.0)	5 (16.7)	
	Others	1 (3.3)	0 (0)	
Religion	Christian	2 (6.7)	7 (23.3)	$\chi^2=8.501$ , df=2, p=0.014 (S*)
	Hindu	28 (93.3)	19 (63.4)	
	Muslim	0 (0)	4 (13.3)	
Educational Status	Diploma	0 (0)	1 (3.3)	$\chi^2=3.606$ , df=2, p=0.165 (NS)
	Undergraduate	22 (73.3)	26 (86.7)	
	Postgraduate	8 (26.7)	3 (10.0)	
Marital Status	Unmarried	25 (83.3)	18 (60.0)	$\chi^2=4.022$ , df=1, p=0.045 (S*)
	Married	5 (16.7)	12 (40.0)	
Type of Family	Nuclear	23 (76.7)	12 (40.0)	$\chi^2=12.707$ , df=3, p=0.005 (S**)
	Joint	7 (23.3)	9 (30.0)	
	Extended	0 (0)	6 (20.0)	
	Alone	0 (0)	3 (10.0)	
Family Monthly Income	≤ ₹20,000	12 (40.0)	4 (13.3)	$\chi^2=8.974$ , df=3, p=0.030 (S*)
	₹21,000–30,000	9 (30.0)	6 (20.0)	
	₹31,000–40,000	5 (16.7)	13 (43.4)	
	> ₹40,000	4 (13.3)	7 (23.3)	
Habits	Smoking	4 (13.3)	7 (23.3)	$\chi^2=2.066$ , df=2, p=0.356 (NS)
	Alcohol	2 (6.7)	4 (13.4)	
	No habits	24 (80.0)	19 (63.3)	
Support System	Friends	9 (30.0)	13 (43.3)	$\chi^2=11.345$ , df=3, p=0.010 (S**)
	Parents	17 (56.7)	5 (16.7)	
	Mentor	1 (3.3)	4 (13.3)	
	Peer group	3 (10.0)	8 (26.7)	
Work Experience	Recently joined	4 (13.3)	2 (6.7)	$\chi^2=2.691$ , df=3, p=0.442 (NS)
	1–3 years	20 (66.7)	21 (70.0)	
	4–7 years	3 (10.0)	6 (20.0)	
	≥8 years	3 (10.0)	1 (3.3)	
Travel Mode	Public transport	4 (13.3)	12 (40.0)	$\chi^2=45.333$ , df=3, p=0.0001 (S***)
	Four-wheeler	0 (0)	17 (56.7)	
	Two-wheeler	24 (80.0)	0 (0)	
	Others	2 (6.7)	1 (3.3)	

Travel Distance	≤5 km	14 (46.7)	4 (13.3)	$\chi^2=8.965$ , $df=3$ , $p=0.030$ (S*)
	6–10 km	3 (10.0)	4 (13.3)	
	11–20 km	6 (20.0)	14 (46.7)	
	>20 km	7 (23.3)	8 (26.7)	
Health Status	No check-up	7 (23.3)	5 (16.7)	$\chi^2=0.754$ , $df=3$ , $p=0.860$ (NS)
	Healthy	14 (46.7)	15 (50.0)	
	Satisfactory	9 (30.0)	10 (33.3)	
Previous Stress Therapy	Never	28 (93.3)	26 (86.6)	$\chi^2=2.074$ , $df=2$ , $p=0.355$ (NS)
	Rarely	2 (6.7)	2 (6.7)	
	Occasionally	0 (0)	2 (6.7)	

**Note:** NS – Not Significant; S\* – Significant ( $p<0.05$ ); S\*\* – Highly Significant ( $p<0.01$ ); S\*\*\* – Very Highly Significant ( $p<0.001$ )

The analysis revealed that most demographic variables such as age, gender, habitant, educational status, habits, work experience, health status, and previous exposure to stress management therapy showed no statistically significant difference between the experimental and control groups ( $p>0.05$ ), indicating group homogeneity. However, significant differences were observed in religion ( $p=0.014$ ), marital status ( $p=0.045$ ), type of family ( $p=0.005$ ), family monthly income ( $p=0.030$ ), support system ( $p=0.010$ ), travelling mode ( $p=0.0001$ ), and travelling distance ( $p=0.030$ ). Overall, despite a few significant variations, the groups were comparable for most baseline characteristics.

**Table 2: Pretest and Posttest Level of Stress among IT Professionals (Experimental and Control Groups) (N = 60)**

Level of Stress	Experimental Pretest F (%)	Experimental Posttest F (%)	Control Pretest F (%)	Control Posttest F (%)
Chilled out and relatively calm ( $\leq 15$ )	0 (0)	5 (16.7)	5 (16.7)	5 (16.7)
Fairly low (16–20)	9 (30.0)	23 (76.6)	6 (20.0)	6 (20.0)
Moderate stress (21–25)	18 (60.0)	2 (6.67)	13 (43.3)	13 (43.3)
Severe stress (26–30)	3 (10.0)	0 (0)	4 (13.3)	4 (13.3)
Stress level potentially dangerous (31–40)	0 (0)	0 (0)	2 (6.67)	2 (6.7)

The pretest findings showed that the majority of participants in the experimental group had moderate stress (60.0%), while in the control group the majority also had moderate stress (43.3%). In the posttest, the majority of the experimental group shifted to fairly low stress (76.6%), whereas the control group majority remained at moderate stress (43.3%), indicating no change.

**Table 3: Effectiveness of Kapalbhathi Breathing Technique on Stress and Coping among IT Professionals (N = 60)**

Variable	Group	Pretest Mean $\pm$ SD	Posttest Mean $\pm$ SD	Mean Difference	Paired t-value & p-value
Stress	Experimental	21.73 $\pm$ 3.32	17.63 $\pm$ 3.13	4.10	$t = 7.860$ , $p = 0.0001$ (S***)
	Control	21.66 $\pm$ 5.18	21.60 $\pm$ 5.12	0.06	$t = 1.439$ , $p = 0.161$ (NS)
Coping	Experimental	14.03 $\pm$ 3.17	16.90 $\pm$ 2.52	2.87	$t = 4.807$ , $p = 0.0001$ (S***)
	Control	15.30 $\pm$ 2.80	15.40 $\pm$ 2.74	0.10	$t = 1.361$ , $p = 0.184$ (NS)

**Note:** \* $p<0.001$  (Highly Significant); NS – Not Significant ( $p>0.05$ )

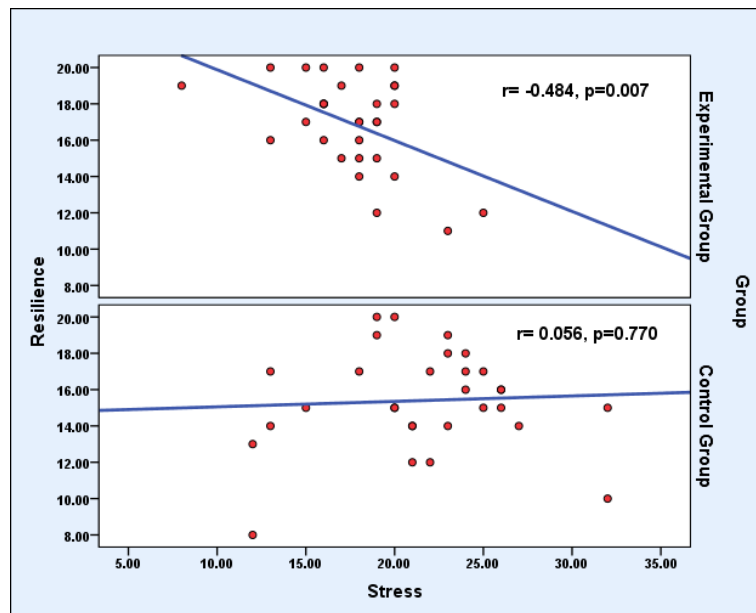
The findings showed that the majority improvement in the experimental group was reflected by a reduction in mean stress score from 21.73 to 17.63 and an increase in coping score from 14.03 to 16.90, which was statistically significant ( $p < 0.001$ ). In contrast, the control group showed minimal change in stress (21.66 to 21.60) and coping (15.30 to 15.40), which was not statistically significant ( $p > 0.05$ ).

**Table 4: Correlation between post test stress and coping scores among IT Professionals in the control group.**

Variables	Control group		Karl Pearson’s Correlation “r” & p-Value
	Mean	S. D	
Post test Stress	21.60	5.12	r = 0.056 p = 0.770, N. S
Post test Coping	15.40	2.74	

\*\* $p < 0.01$ , S – Significant N.S – Not Significant,  $p > 0.05$

The table shows that there was a weak positive correlation ( $r = 0.056$ ) between post-test stress and coping scores in the control group, which was not statistically significant ( $p = 0.770$ ).



**Fig.1 Scatter diagram showing the correlation between post test stress and coping scores among IT Professionals in the experimental group and control group**

**Table 5: Association of post-test level of stress among IT Professionals with their selected demographic variables in the experimental group.**

Demographic Variable	$\chi^2$ Value	df	p-value	Significance
Habitant	25.565	6	0.0001	S***
Educational Status	10.012	2	0.007	S**
Gender	8.709	2	0.013	S*

**Note:** \*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

The table shows that habitant ( $\chi^2 = 25.565$ ,  $p = 0.0001$ ), educational status ( $\chi^2 = 10.012$ ,  $p = 0.007$ ), and gender ( $\chi^2 = 8.709$ ,  $p = 0.013$ ) had a statistically significant association with post-test level of stress among IT professionals in the experimental group.

**Table 4.5.2: Significant Association of Post-test Level of Coping with Selected Demographic Variables (Experimental Group, N=30)**

Demographic Variable	$\chi^2$ Value	df	p-value	Significance
Family Monthly Income	12.659	6	0.049	S*

**Note:** \*p<0.05

The table shows that family monthly income ( $\chi^2=12.659$ , p=0.049) had a statistically significant association with post-test level of coping among IT professionals in the experimental group.

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