



## EFFECT OF RELAXATIVE YOGA PRACTICES ON STRESS, SLEEP AND QUALITY OF LIFE IN FEMALE SCHOOL TEACHERS

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### ABSTRACT

**Background:** Stress encountered by a teacher is a kind of disagreeable and undesirable feelings like anger, anxiety, tension, frustration or depression etc. in teaching profession. The study aimed to see the effect of Nadishuddhi & Bhramari Pranayama along with Yoganidra (YN) on stress, sleep and quality of life among school teachers.

### Methodology:

The study is carried out to see the changes in 54 female school teachers age ranging from 22 to 60 years. In Yoga Group (n=28, mean age 36.54±7.10 and Control Group (n=26, mean age 37.96±7.83) were recruited for the study. Yoga Group (YG) was given 5 min of Nadishuddhi& Bhramari Pranayama with 20 minutes Yoganidra relaxation 6 days in a week for 3 weeks and Control Group (CG) continued with regular activities as usual. Both groups had been assessed before and after with Perceived Stress Scale (PSS), Pittsburgh Sleep Quality Index (PSQI) and Quality of Life (QOL) Questionnaires.

### Results

Perceived Stress Scale reduced (23%, P< 0.001), Pittsburgh Sleep Quality Index (PSQI) Improved (37%, P< 0.001) in Yoga Group with significant difference between Groups (P < 0.001). In Quality of life Physical Health

(15%,  $P < 0.001$ ), Psychological Health (20%,  $P < 0.001$ ), Social Relation (26%,  $P < 0.001$ ), Environmental Health (25%,  $P < 0.001$ ) data showed significant improvement in yoga group compared with control group ( $P < 0.001$ ).

## **Conclusion**

Three weeks of relaxative yoga practices are very effective to reduce stress, disturbances of sleep and improve quality of life in teaching professionals.

## **Key Words**

School Teacher, Stress, Yoganidra, Pranayama, Sleep, QOL.

## **1.0 Introduction**

The stress which is felt by teacher is the experience of a negative kind of qualities coming out of work in his profession. Brown et al (1999) defines the regular communications with students, co-workers and the constant and disorganized workload in probably culminates in too much pressures and challenges, which may accumulate as stress.<sup>1</sup> Teaching stress is termed as "the experience by a teacher of unpleasant emotions, such as tension, frustration, anxiety, anger, and depression, resulting from aspects of work as a teacher" by Kyriacou et al (1987).<sup>2</sup>

### **1.1 Impact of stress on school teacher & teaching profession.**

Kedjidian et al (1995) defines stress creates different problems wherever it is found in the people which results in multifarious ways such as poor optimism, job discontent, bunking off, dropped output, and high medical costs.<sup>3</sup> The area of education related stress gives adverse effect on teachers' health, well-being and even performance.<sup>4</sup> Pervez et al (2003) has reported that female teachers who were in stress for longer duration expressed physical, psychological and emotional disturbances in their nature.<sup>5</sup>

### **1.2 Prevalence of stress in teaching profession**

Prevalence of occupational stress in the teaching profession has been a new trend in the last twenty years. The teachers stress has led to so many psychological disturbances. The overall prevalence of depression over the teachers has been reported 3% to 5% and in

secondary it was 1%, at the post-secondary 4%, at the elementary level 5% and 10% for special education.<sup>6</sup>Agai-Demjaha et al (2015) reported that a large number of teachers associate their perceived strong stress with work place.<sup>7</sup> It has been reported that there is no difference between new and experienced teacher's stress. The research shows that there is no much difference of stress in upper grade teacher (18.5%), female teachers (15.38 %) & teacher with university education (13.48 %).<sup>7</sup>

### **1.3 Coping strategies:**

Several coping strategies were adapted to deal with teaching stress such as music therapy, aroma therapy, biofeedback, progressive muscle relaxation (PMR), cognitive-behavioural therapy, mindfulness meditation and relaxation technique etc. as stress reliever. Music has a very positive and significant impact over the body by reducing the activity of alpha-amylase and systolic blood pressure at the psycho-physiological level.<sup>8</sup>Progressive muscle relaxations with music and aromatherapy have exhibited decreased stress among teachers.<sup>9</sup>Progressive muscle relaxation has been effective in improving lipid profile in female school teachers.<sup>10</sup>In a brief Cognitive-behavioural Stress Management Programme all the teachers who participated found themselves that their stress reduced when they handled the teaching tasks. Even the dysfunctional thoughts decreased and stress management skill improved after the therapy reported that teachers experienced less work-related stress and reduced dysfunctional thoughts.<sup>11</sup>Mindfulness Meditation techniques is effective tool in improving anxiety, depression, and stress for primary school teachers.<sup>12</sup>

### **1.4 Yoga versus Mind –Body Therapy**

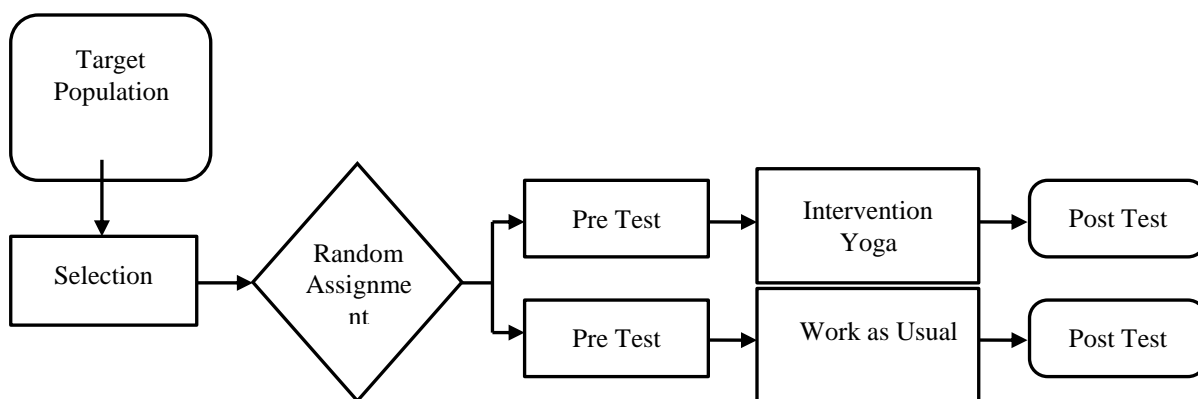
Yoga group showed significant decrease in somatisation of stress, increased quality of life, quality of sleep and reduction in discomfort due to over breathing on 140 subjects.<sup>13</sup>The practice of mind sound resonance technique (MSRT) eased in decreasing stress, anxiety, fatigue and psychological distress. The relaxation technique also improved the self-esteem and quality of sleep among female teachers in primary schools.<sup>14</sup>

Earlier studies carried out on Nadishuddhi showed reduction in cardiovascular parameters, decrease in Perceived Stress Scale, improvement in Psychological well-being function<sup>15</sup>, decreases in high blood pressure<sup>16</sup>, decrease in Respiratory rate<sup>17</sup>, increasing respiratory muscle strength.<sup>18</sup> Some findings also exhibited that Yoganidra is very effective tool to lessen anxiety, depression and high blood pressure,<sup>19</sup> hand grip strength, heart rate ratio,<sup>20</sup> decreases in anxiety, emotional reactivity and increased feeling of relaxation.<sup>21</sup>

Thus there are very few studies done to see the effect of Nadishuddhi, Bhramari Pranayama and Yoganidra on stress, sleep and quality of life among female school teachers. Hence, the current study is carried out to explore the combined effect of Bhramari Pranayama, Nadishuddhi pranayama & Yoganidra among female school teacher.

## **2.0 Material and Methods**

**2.1 Design of Study:** An experimental two group pre post study was carried out in, The Canadian Public school and Apollo Public School, Bangalore, Karnataka. 54 Female teachers participants age range was from (22-60) years, with no known clinical health issues, who were willing to participate & who were not exposed to any yoga practices earlier were included in the study. Subjects having medical illness, psychiatric disorder; recent surgery, pregnancy & who had earlier exposed to yoga were excluded from the study. Informed signed consent was taken from all the participants and all ethical consent necessary to conduct the study had also been taken. Participants were divided in Yoga Group (n=28) and Control Group (n=26) Yoga Group (YG) was given 5 min of Nadishuddhi, Bhramari Pranayama and Yoganidra for 20 min daily comprised of 6 days a week for 3 weeks and Control Group (CG) continued their regular activities. Both groups had been assessed with the Perceived Stress Scale (PSS), Pittsburgh Sleep Quality Index (PSQI), and Quality of Life (QOL) Questionnaires. The following assessments were done in the beginning of the research as baseline and after three weeks of intervention. Both the groups, YG and CG were called to attend the assessment processes on the fixed days.



## 2.2 Measurements (Variables)

### 2.2.1 Perceived Stress Scale (PSS)

PSS is a valid and reliable psychological instrument to assess perceived stress. The set of 10 questions is to determine the lives of the respondents and level of stress during the past one month. The scores are received by drawing back responses (e.g., 0=4, 1=3, 3=1 & 4= 0) to the four positively stated items (4, 5, 7 & 8) and summing across all scale items. A short 4 item scale can be made from questions 2, 4, 5 and 10 of the PSS scale.<sup>22</sup>

### 2.2.2 Quality of Life (WHQOL)

Quality of Life questionnaire prepared by World Health Organization is a standardized instrument to assess Quality of Life of four domains; physical health, psychological health, social relationships and environmental health. It also includes two questions for 'overall quality of life' and 'general health facets'. The range of scores is 4-20; higher score indicates higher quality of life. The internal consistency ranged from 0.66-0.87 (Chronbach's alpha co-efficient). The scale is found to be very good discriminate validity and good test retest reliability and is recommended for the usage of health surveys and to determine and measure efficacy of any intervention at suitable intervals in the research as per need.<sup>23</sup>

### 2.2.3Pittsburgh Sleep Quality Index

Pittsburgh sleep quality index is questionnaire designed to assess the sleep quality and disturbances in sleep over a one-month time interval. Nineteen individual items are there to generate seven 'components' scores: subjective sleep quality, sleep latency, sleep

duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. The sum of scores of all these seven components produces one global score. Clinical and clinometric properties of PSQI were assessed over an eighteen months' period with "good" sleepers and "poor" sleepers, sleep disorder patients. Acceptable measure of interval homogeneity, consistency (test-retest reliability) and validity were obtained. A global PSQI score > 5 yielded a diagnostic sensitivity of 89.6 % ( $\kappa=0.75$ ,  $p<0.001$ ) in distinguishing between good and bad sleepers.<sup>24</sup>

### 3.0 Interventions:

**3.1 Yoganidra:** Yoganidra is a systematic practice in Hatha Yoga often practiced to overcome stress and get complete physical, mental and emotional relaxation. Yoganidra is one of the techniques where deep relaxation is achieved by turning mind inwards separated from external experiences and sleep. The practice has different steps to progress with instructions directed to move consciousness on different positive and natural objects including body parts. It starts with preliminary adjustment of the body, preliminary relaxation of the whole body, preliminary relaxation of the mind, sankalpa or resolve, a short simple statement of one's individual aim, rotation of awareness through all the parts of the body, external and internal, visualization & finish with return to the external awareness.<sup>25</sup>

*Yoganidra* is a unique technique primarily very much different from other relaxation in terms of quantity. It is a 'conscious sleep' where all the tensions and anxiety are wiped out from the mind to attain a more blissful and comfortable state of mind. Research studies have reported that the technique plays very vital role as a therapy to cure and overcome various psychological disorders. It positively provides smoothening effects and helps to reduce regression, stress and guilt in both male and female.<sup>26</sup> (Kumar, 2013). Study has shown that Yoganidra decreases somatic form symptoms in patients with menstrual disorder by learning and applying Yoganidra.<sup>27</sup> Yoganidra significantly improves mental and emotional health of emotionally abused adolescents.<sup>28</sup>

**3.2 Nadishuddhi pranayama** (nds) starts with exhalation through both the nostrils. In this technique one breathes in through left and breathes out through right and again inhaling through right and exhaling through left to complete one round. This specific pranayama is practiced in different in different disordered conditions to bring the mind in the calmed and balanced state. Study has reported that regular practice of Nadishuddhi pranayama helps to reduce stress in medical students by reducing the autonomic arousal on different parameters in them.<sup>29</sup> Regular practice of Nadishodhana increases parasympathetic activity by calming down the mind.<sup>17</sup> It is very much effective technique in reduction of pulse rate, respiratory rate and increase in Peak Expiratory Flow Rate.<sup>30</sup> Another study on Nadishuddhi reported that the regular practice of Nadishuddhi improves the concentration, enhances learning process and helps to minimize the stress and improve academic performance in students.<sup>31</sup>

**3.3 Bhramari Pranayama (BhPr):** Current study employed the technique to teach all the participants which involves producing a vibrating sound while exhaling through both the nostril -right and left. The generated sound may be termed as emulating the buzzing of bumblebees, having a constant pitch. Earlier studies directly or indirectly have found the effect of BhPr to have parasympathetic predominance, reduction in heart rate and high blood pressure, reduction in response to cold pressor test, improvement in cognition, reduction in irritability in tinnitus, favourable EEG changes and reduction even in stress levels.<sup>32</sup> Bhramari Pranayama ensues a relaxed state of mind in which parasympathetic activities override the sympathetic activities. Research shows that Bhramari pranayama improved significantly the resting cardiovascular parameters in healthy adolescents.<sup>33</sup>

#### **4.0 Data Extraction and Data Analysis**

Statistical analysis was carried out using SPSS, version 10.0 (SPSS, Chicago, IL, USA). The values were checked for normal distribution by the Shapiro-Wilk test. As the data were not normally distributed, analyses of the data were done using Mann-Whitney and Wilcoxon Signed Ranked test within and between groups comparison.

## 5.0 Results

Perceived stress scale reduced (PSS) in yoga group (23%,  $p < 0.001$ ) with significant difference between groups ( $P < 0.001$ ). (Refer to Table-1) Pittsburg sleep quality index (PSQI) reduced in yoga group (37%,  $p < 0.001$ ) with significant difference between groups ( $P < 0.001$ ). Quality of Life (QOL-Brief) also showed very positive changes in the result: There was improvement in the Quality of Life in Yoga Group as compared with control group. (See the Graph-I&II) Physical Health in yoga improved (15%,  $p < 0.001$ ) with significant difference within group & between groups ( $p < 0.001$ ). Psychological Health in yoga group improved (20%,  $p < 0.001$ ) significantly within group & between groups ( $p < 0.001$ ). Social Relation in yoga group showed improved result (26%,  $p < 0.001$ ) significantly within group & between groups ( $p < 0.001$ ). Environmental Health in yoga group also exhibited significant improvements when compared with control group improved from (25%,  $p < 0.001$ ). (See the Graph-I&II)

**Table.1.** Showing the changes in values of PSS, PSQI & QOL parameters before and after Yoga intervention in Experimental and Control groups.

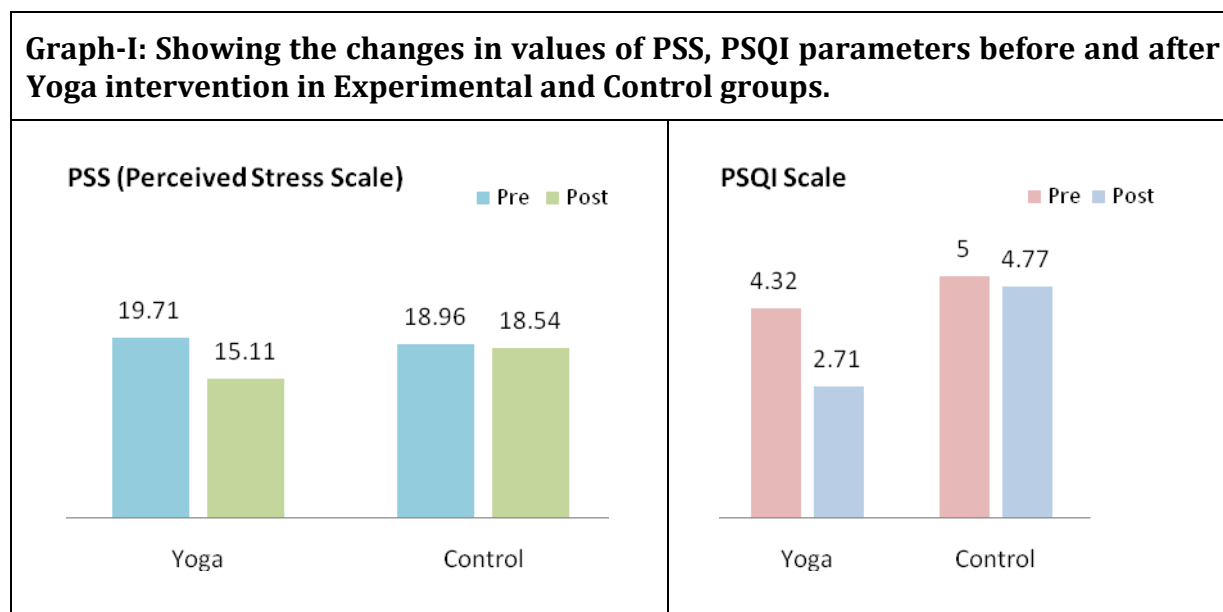
Variables	Group	Pre	Post	% change	Sig- P values		
					Within Groups (Wilcoxon)	Between Groups (Mann-whiney)	
					Pre/Post	Pre/pre	Post/post
PSS	Yoga N=28	19.71 ±4.39	15.11 ±3.15	23%	0.001**	0.509	0.001**
	Control N=26	18.96 ±4.42	18.54 ±3.96	2%	0.02*		
PSQI	Yoga N=28	4.32 ±1.96	2.71 ±1.56	37%	0.001**	0.648	0.017*
	Control	5.00	4.77	4%	0.014*		



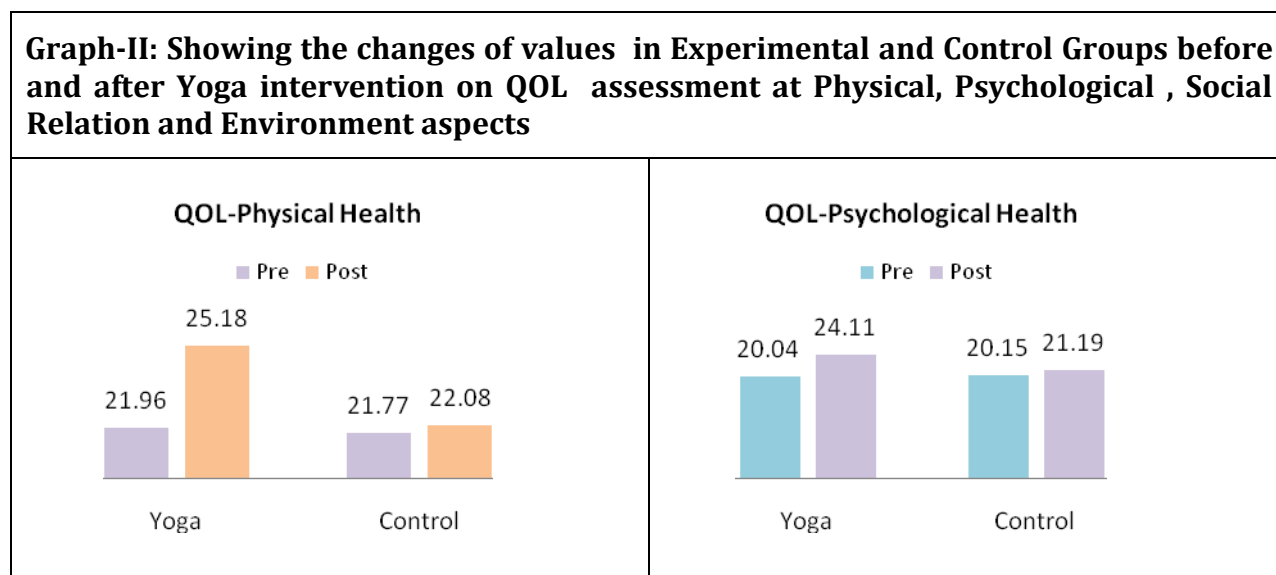
	N=26	±3.24	±2.97				
QOL-I (Physical Health)	Yoga N=28	21.96 ±2.47	25.18 ±2.34	15%	0.001**	0.786	0.001**
	Control N=26	21.77 ±2.70	22.08 ±2.21	1.5%	0.468		
QOL-II (Psychological Health)	Yoga N=28	20.04 ±2.33	24.11 ±0.74	20%	0.001**	0.294	0.001**
	Control N=26	20.15 ±3.83	21.19 ±3.27	5%	0.017*		
QOL -III (Social relation)	Yoga N=28	11.11 ±1.73	14.04 ±1.86	26%	0.001**	0.629	0.001**
	Control N=26	11.35 ±2.04	12.15 ±1.26	7%	0.024*		
QOL-IV (Environmemta l)	Yoga N=28	27.36 ±5.28	28.07 ±5.84	25%	0.752	0.664	0.958
	Control N=26	27.62 ±4.17	28.08 ±3.92	1.5%	0.172		
Wilcoxon’s signed ranks test (within groups); Mann Whitney U test (Between groups)							
Legend: There is significant difference between groups with better improvement in Yoga group.							

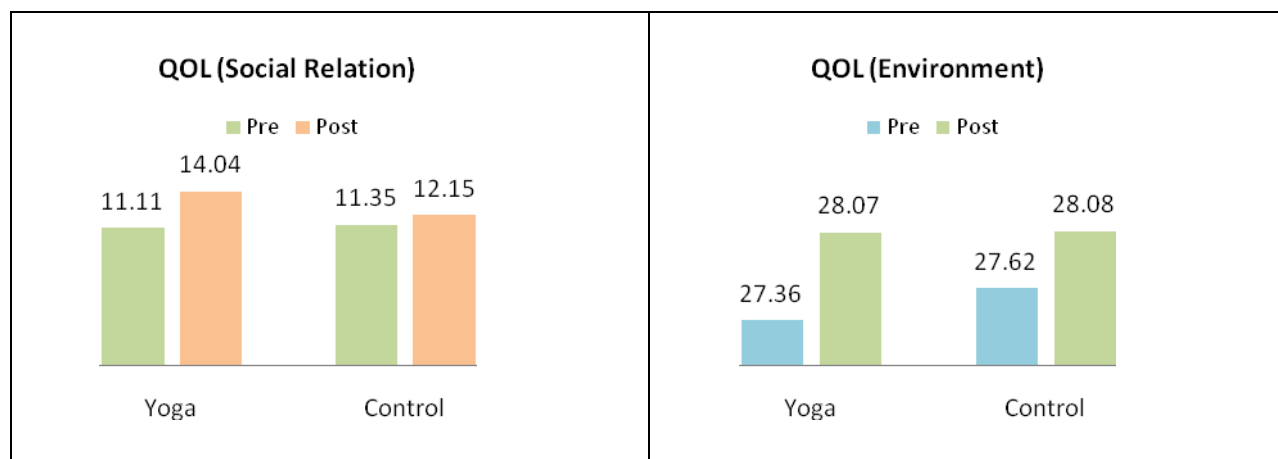
**\*P<0.05, \*\*<0.001, PSS=** Perceived Stress Scale, **PSQI=** Pittsburg Sleep Quality Index, **QOL=** Quality Of Life

**Graph-I:** Showing the changes in values of PSS, PSQI parameters before and after Yoga intervention in Experimental and Control groups.



**Graph-II:** Showing the changes of values in Experimental and Control Groups before and after Yoga intervention on QOL assessment at Physical, Psychological, Social Relation and Environment aspects.





## 6.0 Discussion

This present study has shown the significant reduction in perceived stress, significant improvement in sleep & quality of life after three weeks of practice of Nadishuddhi, Bhramari & Yoganidra among female school teachers. Earlier studies also have reported in randomized control trial where Nadishuddhi pranayama showed very positive results perceived stress and cardiovascular functions in young healthy students in the study where sample size of  $n=30$  were given Nadishuddhi for 30 min, 3 times a week for the duration of 12 weeks. There was a significant decrease in mean perceive stress scale difference of 4.67 and SD of 4.5 is 0.99 which shows adequate sample size was and good strength of the study.<sup>29</sup>Nadishuddhi Pranayama showed positive effect on autonomic functions on healthy females' volunteers' with sample size of  $n=30$  for 12-weeks. The result showed significant decrease in diastolic blood pressure response and isometric hand grip test also was the significant at  $p<0.05$ .<sup>30</sup>Present study also showed the results in the line of earlier findings where significant reduction on Perceived Stress Scale (PSS) in Yoga Group (23%,  $P<0.001$ ) is seen and with significant difference between Groups ( $P<0.001$ ).

Studies on the impact on ESR (Erythrocyte Sedimentation Rate) level through Yoganidra on healthy subjects for 30 min for 6 months' duration also exhibited the positive results on female subjects. With sample size of 40 female suggested significant reduction in (t value-0.01) ESR levels & the significant change in ESR level t value 2.82.<sup>34</sup>30 minutes' practice of

Yoganidra for duration of 6 months suggest significant changes (“t” value= 0.01 & 7.89) in stress, anxiety and general well-being on college going students.<sup>35</sup>The current study also found the same result due to practice of breathing practices and specific techniques such as Yoganidra, Bhramari and relaxation techniques as shown in Table-I.

A prospective, longitudinal, quasi-experimental study on quality of life reported significant improvement on 73 subjects for the intervention of 24 week yoga practice of one hour duration (Phy: 14.6% , Psy: 13.7%, SR: 19.3%, EN: 10.9%) and a reduction of psychological distress.<sup>36</sup>A total of 88 nursing women showed improvement in CLBP (chronic low back pain) after receiving yoga therapy for 1 h/day and 5 days a week for 6 weeks indifferent domain of quality of life-physical, psychological, and social health domains (Phy:44.12%, PSY: 97.07%, SR: 55.02%, EN: 2.81%).<sup>37</sup>Sixty female patients of chronic pelvic pain received yoga therapy in the form of asanas, pranayama, and relaxation along with the conventional therapy for 8 weeks and reported reduction in the pain intensity and improvement in different domain of WHO –QOL: quality of life BREF (Phy: 68.17%, Psy: 51%, SR: 30.73%, EN: 3.83%).<sup>38</sup>It was also found in the current study that after practice of relaxative techniques all aspects of quality of life improved which is in the line of earlier studies.

Stress was found to be reduced on 40 healthy subjects who practiced pranayama 2 hours per day for 20 days ( $p<0.05$ ), improved sleep quality (PSQI: 29.09%)& positive changes in heart rate.<sup>39</sup> After 6 months of Yoga practice, significantly better performances on eighty elderly people in the sleep patterns was seen(PSQI: 14.37%).<sup>40</sup>A study reported that after eight week of meditation performed at workplace significant changes were found in sleep quality both in subjective (PSQI: 23%) and objective (PSG) measures.<sup>41</sup>Yogic practices are reported to be very effective in reducing sleep disturbances. Current study observes significant improvement in sleep quality index after practicing relaxative techniques.

Nadishuddhi Pranayama on 60 subjects for 12weeks showed decreased perceived stress (26.31%) & improved cardiovascular autonomic parameters.<sup>29</sup>A study carried out with 12 weeks' intervention of modified slow breathing. The result was very effective in reducing perceived stress (PSS: 3.67%) and improving cardiovascular parameters.<sup>42</sup> Another study

carried out on 40 healthy subjects who practiced pranayama for 20 days showed significant reduction in perceived stress (PSS: 57.69), improved sleep quality, and decreased blood pressure.<sup>39</sup>In this way, Nadishuddhi pranayama was very effective to influence positively on the physiological pattern of cardiovascular system which is seen in perceive stress in the study.

Thus on the basis of results shown in the above table (result section), the study exhibited the very positive changes in different parameters selected for the explorations. The current study shown that improvement in Quality of Life, Physical Health significant difference (15%,  $p < 0.001$ ), Psychological Health (20%,  $P < 0.001$ ), Social Relation (26%,  $P < 0.001$ ) & Environmental Health (25%,  $P < 0.001$ ) in yoga group after three weeks of intervention.

The nature of the yogic practices is to calm down the mind in which the parasympathetic dominance is created. In the tense conditions, the sympathetic nervous system (SNS) prepares the mind and body to cope up with stressful challenges by n by increasing the capacity of skeletal muscles, heart rate, sugar and fat levels, perspiration, mental activity, while reducing blood clotting time, intestinal movement, and tears. The SNS also activates the bladder to relax, pupils to dilate, and most blood vessels to constrict so that other parts of the body gets sufficient nutrients.<sup>43&44</sup>In earlier studies Yoga has been proved to reduce the stress. It does so by down regulation of Hypothalamus–Pituitary Axis and the SNS. Ultimately, sympathetic dominance, vagal withdrawal, and baroreceptor impairments which result due to distress are corrected and homeostatic balance is re-established. Therefore, slow breathing exercises such as Nadishuddhi Pranayama can be used as a stress coping tool in Female yoga teacher along with other stress management techniques.

**7.0 Strengths of the Study:** It is a unique study carried out to explore the yogic intervention in the school premises to see the effect of relaxative yogic practices on female teachers. It was designed to assess the quality of life among school teacher & this unique study has combined effect of Nadishuddhi, Bhramari &Yoganidra. This study extremely benefitted female school teacher to improve their mental & physical health.

**8.0 Limitations of the study:** Limitations in this study are the short term duration of yogic practices, less sample size, only subjective assessment, all female teachers were of varied areas of teaching disciplines.

**9.0 Suggestions for future work:** Future studies can be done with randomized control trial (RCT) design study, compared with control group, large sample size, spending more time in intervention, more objective tests also may be included to get more reliable and convincing results to understand the mechanism involved in psychological disorders in the teaching staffs and students as well.

## 10 Conclusion

Three weeks of relaxative Yoga practices are very effective to reduce stress, disturbances of sleep and improve quality of life in female teaching professionals.

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