Original Research Paper

Volume - 13 | Issue - 12 | December - 2023 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Physiology

IMMEDIATE EFFECT OF ANULOMA AND VILOMA PRANAYAMA ON TEST ANXIETY AND TEST PERFORMANCE AMONG MEDICAL STUDENTS: A CROSS SECTIONAL STUDY

Sushma S* — Assistant Professor, Department of physiology, Bangalore medical college and research institute *Corresponding Author

M S Kusumadevi — Professor, Department of physiology, Bangalore medical college and research institute

ABSTRACT **Background:** Students of medicine are always under stress. And an optimally stressed student may bring out his or her best in academics. However, extremes of stress can result in stress induced disorders and deteriorating performance. Anuloma Viloma Pranayama or alternate nostril breathing exercise is a remarkable breathing exercise that is said to bring several physical and psychological benefits. Hence, the present cross-sectional study was conducted in first year MBBS students, to determine the benefits of a single session of anuloma viloma on test anxiety and test performance. **Methods:** 32 First year medical students of either sex, aged 18-22 years of Bangalore medical college and research institute, Bengaluru were recruited for the study. The enrolled Students were administered the State trait anxiety scale. Then the students were randomly allocated into study and control group. The study group were given an intervention of Anuloma Viloma pranayama followed by a short period of meditation for 20 minutes. Post intervention, the subjects of both the study and the control group were given the STAI scale, to record the anxiety score. The students then were allowed to write their theory internal exam. The effect of pranayama intervention on the test anxiety and test performance (marks secured) among the students, were subjected to statistical evaluation. **Results:** There was no statistically significant difference in STAI scores in study group before and after intervention and there was no significant difference of test performance between study and control group. **Conclusions:** Our study conducted to see the immediate effect of pranayama on stress scores and test performance yielded no significant differences before and after intervention in the study group either regarding stress scores or test performance.

KEYWORDS : Stress Scores, Test Performance, Anuloma Viloma, Medical Students

INTRODUCTION

Anxiety and Stress is the wear and tear changes that our bodies experience as we adjust to our continually changing environment; it affects both physically and emotionally. When students appraise their education as a challenge, stress can bring them a sense of competence and enhance the learning process. When education is seen as a threat by the student, stress can elicit feelings of helplessness and leads to poor academic performance. Students of medicine are always under stress. And an optimally stressed student may bring out his or her best in academics. However, extremes of stress can result in stress induced disorders and deteriorating performance.[1]

Pranayama, a Sanskrit word formed by two words, namely "prana," meaning breath of life/vital energy, and "ayama," meaning expansion/regulation/control.[2] AnulomaViloma Pranayama or alternate nostril breathing exercise is a remarkable breathing exercise that involves holding one nostril closed while inhaling, and then the other nostril closed while exhaling. AnulomaViloma is the perfect addition to any sort of meditation practice. This form of pranayama is said to bring several physical and psychological benefits.

Research studies indicate that medical students, who otherwise face lot of stress and anxiety during internal assessment, both practical and theory examinations, will stand to benefit if they follow a set of yoga exercises. A 2016 bibliographic review concluded that yoga has beneficial effects on a variety of psychiatric and medical conditions. [3]

However, there is a paucity in various studies regarding the immediate effect of Anuloma viloma pranayama. Hence, the present cross-sectional study was conducted in first year MBBS students, to determine the benefits of a single session of Anuloma viloma on test anxiety and test performance.

MATERIALS AND METHODS:

Source of data: First year medical students of either sex, aged 18-22 years of Bangalore medical college and research institute, Bengaluru

Methods of Collection of Data:

Study design: A cross sectional interventional study

Study period: August 2022 to December 2022

Place of study: Department of Physiology, Bangalore medical college and research institute

Sample size: 42

Based on the previous study by sumitra sudhakkodhy et.al [6], post intervention STAI score among study and control group was 40.20 ± 6.86 and 45.47 ± 5.24 respectively.

We used the following formula for the sample size (n):

$n = 2(z_{\alpha/2} + z\,1_{-\beta})^2 \sigma^2 / d^2$

Where,

$Z_{\alpha/2}$ = Standard table value for 95% CI = 1.96

$Z_{1-\beta=}$ Standard table value for 80 % power = 0.84

σ = Standard deviation = 6.1

d = effect size = 5.27

$n = 2(1.96 + 0.84)^2 6.1^2 / 5.27^2 = 583.45 / 27.77$

n = 21 each group

E. Inclusion Criteria:

- Students who are willing to give written informed consent.
- Students in the age group of 18-22 years.
- Students willing to practice anuloma viloma pranayama for 20 minutes

Exclusion Criteria:

- Students not willing to give consent
- Students with a medical condition or physical limitation that would preclude their ability to participate in yoga.
- Students who are already practicing yoga / pranayama.

Methodology:

After obtaining approval and clearance from the institutional ethics committee,32 first year medical students were recruited for the study as per inclusion and exclusion criteria. Baseline data was recorded as per the study proforma for general physical examination. The enrolled Students were administered the State trait anxiety scale. Then the students were randomly allocated into study and control group. The study group were given an intervention of Anuloma Viloma pranayama followed by a short period of meditation, by a qualified yoga instructor for 20 minutes. Post intervention, the subjects of both the study and the control group were given the STAI scale, to record the anxiety score. The students then were allowed to write their theory internal exam. The effect of pranayama intervention on the test anxiety and test performance (marks secured) among the students, was subjected to statistical evaluation. Control group did not practice anuloma viloma pranayama during the 20 minutes of intervention.

Interventional Protocol

Anuloma Viloma pranayama was performed in a balanced meditative posture as per the instructions, by a trained yoga person. And 20 such cycles were repeated. Students meditated before and after the above

protocol for five minutes each.

Assessment tools
General health proforma
State test anxiety inventory for adults scale

Outcome measures
State test anxiety score

RESULTS

Statistical analysis:
The Data was analysed by descriptive statistics such as mean, standard deviation, percentages, tables, and graphs wherever necessary. Shapiro-Wilk test was done to test normality of the data. For inter-group comparison, independent t-test was used. For intra-group comparisons, paired t-test was used for parametric parameters and Wilcoxon signed rank test was used for non-parametric parameters.

The present study was conducted on 32 subjects. After randomisation, 15 subjects were allocated to the study group and 17 subjects were allocated to the control group. Table 1 and figure 1 show comparison of baseline STAI scores between study and control groups. There was no significant difference in baseline STAI scores between the groups. Table 2 and figure 2 show comparison of STAI scores in study group before and after intervention, and there was no significant difference. Table 3 and figure 3 show comparison of STAI scores in control group before and after intervention, and there was no significant difference. Table 4 and figure 4 show comparison of test performance between study and control group, and there was no significant difference.

Table 1: Comparison of baseline STAI Y1 and Y2 scores between study and control groups

Parameters	Study group	Control group	p-value
STAI Y1	49.24 ± 2.51	47.53 ± 2.79	0.07
STAI Y2	49.41 ± 2.21	47.24 ± 4.18	0.07

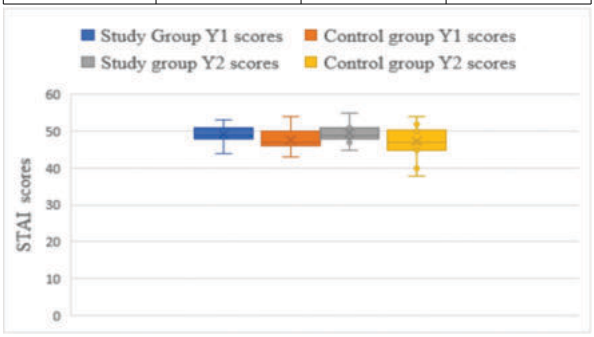

Figure 1: Comparison of baseline STAI Y1 and Y2 scores between study and control groups

Table 2: Comparison of STAI Y1 and Y2 scores between baseline and after intervention in study group

Parameters	Baseline	After intervention	p-value
STAI Y1	49.24 ± 2.51	50.24 ± 3.05	0.15
STAI Y2	49.41 ± 2.21	48.94 ± 2.33	0.51

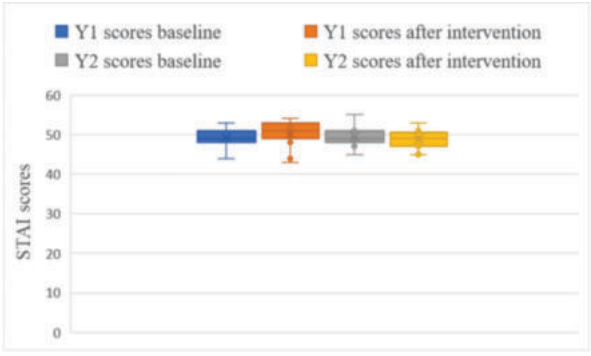

Figure 2: Comparison of STAI Y1 and Y2 scores between baseline and after intervention in study group

Table 3: Comparison of STAI Y1 and Y2 scores between baseline and after intervention in control group

Parameters	Baseline	After intervention	p-value
STAI Y1	47.53 ± 2.79	47.88 ± 3.43	0.28
STAI Y2	47.24 ± 4.18	48.65 ± 2.26	0.15

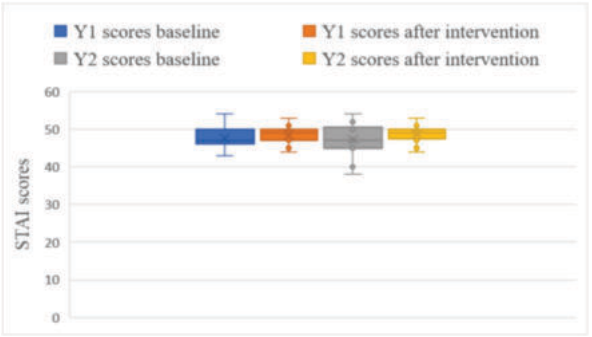

Figure 3: Comparison of STAI Y1 and Y2 scores between baseline and after intervention in control group

Table 4: Comparison of test performance between study group and control group

Parameter	Study group	Control group	p-value
Marks	20.12 ± 3.57	21.47 ± 4.46	0.34

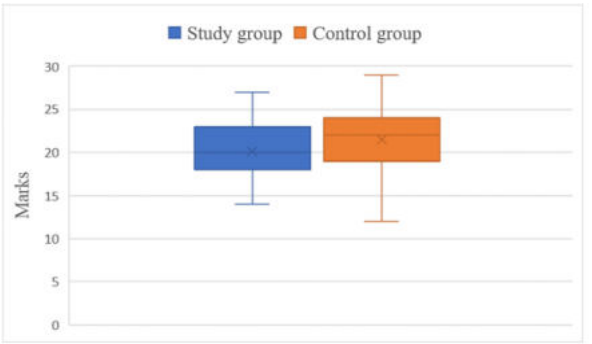

Figure 4: Comparison of test performance between study group and control group

DISCUSSION

Our study was conducted on 32 first year medical students to see the Immediate effect of anuloma and viloma pranayama on test anxiety and test performance (marks secured). They were randomly allocated into study and control groups. Both groups were subjected to STAI scale which measures stress levels, on the day of their theory internal exam. The study group were given an intervention of Anuloma Viloma pranayama followed by a short period of meditation, by a qualified yoga instructor for 20 minutes. Post intervention, the subjects of both the study and the control group were given the STAI scale, to record the anxiety score. The students then were allowed to write their theory internal exam. The effect of pranayama intervention on the test anxiety and test performance (marks secured) among the students, was subjected to statistical evaluation.

There was no statistically significant difference in STAI scores in study group before and after intervention and there was no significant difference of test performance between study and control group.

Majority of the previous studies conducted studies on the long-term effect of pranayama on stress.

One such study by SumitraSudharkodhy et al conducted an interventional study among 150 first year medical students. Spielberger state-trait anxiety inventory (STAI) and Perceived stress scale (PSS) were administered and 60 students with a high anxiety and stress score were selected on the basis of specific inclusion and exclusion criteria and divided into study and control groups. A baseline HRV was documented on all 60 students. 30 students in the study group underwent supervised yoga intervention for one month. Post interventional assessments of anxiety, stress and HRV were done in both groups (study and control group). Integrated yoga intervention significantly decreased state anxiety and perceived stress, and a shift towards parasympathetic dominance in heart rate variability was observed.[4]

Another study by Lona Prasad et al conducted a prospective case-control study of 34 first-to-third-year medical students and measured their levels of perceived stress and sense of wellbeing before and after a six-week yoga and meditation intervention. Paired t tests showed a statistically significant reduction in perceived stress (18.44 versus 14.52) p= 0.004. The results showed a significant improvement in participants levels of peace, focus, and endurance with an increase in points ranging between one and four from baseline, after a six week of yoga and meditation. Improvements in happiness, positivity, personal satisfaction, and self-confidence were also seen after the intervention. The study concluded that Yoga and meditation may be effective in reducing stress levels and improving aspects of personal wellbeing in medicalstudents.[5]

In both the above studies, yoga intervention was done for periods of one month and six weeks respectively. In our study we made the students practice anuloma viloma pranayama for a single sitting on the day of the theory internal exams and evaluated stress before and after the intervention. Our study did not reveal significant reductions on test anxiety levels as evaluated by STAI scale after a single exposure of Anuloma viloma pranayama breathing technique and also did not show any effect on test performance (marks secured). The limitations of our study was the sample size and the intervention of Anuloma viloma was not practised for longer time.

The Pranayam, which is an integral part of Yoga, energizes and balances the different systems of our body and controls the mind and other senses. Prana (energy) and Ayam (to expand or control) form the word Pranayam. So, it is a technique to control or expand the energy in the body. It is a technique to change or control the normal breathing process to make Purak(inhalation), Kumbhak (retention) and Rechak (exhalation) deep and prolong. [6]

Adopting a mindfulness practice for as little as once per week may reduce stress and anxiety in medical students. This is supported by sufficient studies conducted on medical students who undergo more stress throughout their course compared to other professional courses. Administrators should consider including instruction in nonpharmacologic stress and anxiety reduction methods, within curricula in order to support student self-care. Anuloma viloma being a simple breathing technique can be easily imbibed into MBBS curriculum from the start of the course to the end.

REFERENCES:

1. Nivethitha L, Mooventhan A, Manjunath NK. Effects of various Prānāyāma on cardiovascular and autonomic variables. AncSci Life. 2016;36: 72 –7.
2. A. Malathi and A.Damodaran Stress due to exams in medical students – Role of Indian J PhysioPharmacol 1999; 43 (2) : 218-224
3. T. Field. Yoga research reviewComplement TherClinPract, 24 (2016), pp. 145-161
4. Lona Prasad, AneeshaVarrey, Giovanni Sisti, "Medical Students' Stress Levels and Sense of Well Being after Six Weeks of Yoga and Meditation", Evidence-Based Complementary and Alternative Medicine, vol. 2016, Article ID 9251849, vol 2016; 2016
5. Sudharkodhy S, Kutty K, Patil N J, Shankar V, Short term effect of integrated Yoga on anxiety, stress and heart rate variability in first year medical student. Indian J ClinAnatPhysiol 2018;5(1):97-10
6. Dandekar Pradnya Deepak. Impact of shortterm training of anulom vilom pranayam on blood pressure and pulse rate in healthy volunteers. International Journal Of Research in Ayurveda and Pharmacy. 2013; DOI:10.7897/2277-4343.04234