

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/333844135>

EFFECT OF VARIOUS PRANAYAMA ON RESPIRATORY FUNCTIONS WITH SPECIAL REFERENCE TO PRE-OBESE YOUNG HEALTHY INDIVIDUALS

Article · June 2019

CITATIONS

0

READS

32

2 authors, including:



Jaman Mohan Harsoda

SUMANDEEP VIDYAPEETH UNIVERSITY ,VADODARA, INDIA

77 PUBLICATIONS 69 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



PhD thesis [View project](#)

EFFECT OF VARIOUS PRANAYAMA ON RESPIRATORY FUNCTIONS WITH SPECIAL REFERENCE TO PRE-OBESE YOUNG HEALTHY INDIVIDUALS

¹Sanjay Nehe ²J M Harsoda

¹Assistant Professor, ²Professor and Head

¹Department of Physiology,

¹SMBT Institute of Medical Science and Research center, Nashik, India

²SBKS Medical Institute & Research center, Sumandeep Vidyapeeth, Vadodara, India

Abstract:

Background: Pranayama has a very ancient origin in Hindu mythology. In modern times, its importance is increasing day by day due to its beneficial effects on body and mind. Kapalbhata a kind of pranayama improves the functions of the respiratory system and has a direct association with the abdominal fat and the muscle and thereby significant reduction in a basal metabolic index.

Objectives: aimed to see significant effects of different pranayama on respiratory functions in pre-obese young healthy individuals.

Materials and methods: Young healthy individuals willing to participate in the present study were screened for BMI and labeled as pre-obese as per standard criteria (BMI 25-29.99). A total of 44 subjects of the age group of 18-25 years were screened for respiratory parameters, were further subjected to the practice of pranayama. After successful training of pranayama, respiratory parameters were evaluated and compared by using the appropriate statistical method.

Results: A total of 44 pre-obese MBBS students were screened for respiratory parameters and found to be a significant reduction in Respiratory Rate, and increased Forced Expiratory Volume at the of 1st second and so on 2nd and 3rd second (FEV1%, FEV2%, FEV3%).

Key words: Pranayama, respiratory function, pre-obese, healthy individuals

I. INTRODUCTION

In India and other developing countries, due to modern and stagnant lifestyle, young generation is at the highest risk of respiratory diseases. Pollution is also a major contributing factor in developing respiratory diseases along with inertness to exercise and health ¹.

Practicing Pranayamas on a regular basis is one of the key ways to get rid of from respiratory diseases and strengthen the respiratory system along with mind stability ². In a country like India where awareness and resources for health are limited, practicing pranayamas can be a great intervention in reducing respiratory problems ^{3,4}. The yogic exercises like yoga and pranayama can become the solution to defeating the situation by markedly decreasing the risk of developing cardio-respiratory problems and finally to reduce the threat of unhealthy and death ^{5,6}. Practicing Pranayama is best known for enhancement in functions of lungs and heart as well, which require more attention of researchers for further clarification ².

Among all limbs of Ashtanga yoga, pranayama, which comprises different breathing technique found to be very effective and it is also given in modern medicine as well⁷. Pranayamas are having positive effects on various vital organs and systems. Different pranayamas show different physiological effects on various organs and systems that are reported in various scientific studies carried out worldwide ³.

The pranayama is more effective than aerobic exercises as it is low energy consuming practice and reduces basal metabolic index significantly ⁸. Anulom-vilom, known as alternate nostril breathing is a highly effective technique which is followed by kapalbhata and bhastrika, is very easy and can be practiced at home only ⁹.

Practicing pranayama on a regular basis can reduce the risks of stress, anxiety and depressive state of mind. Hence the study established to see the effects of pranayama on respiration among medical students at our institution.

II. MATERIALS AND METHODS

The present study was carried out in the Department of Physiology with a total of 44 pre-obese (BMI in between 25-29.99) medical students of SMBT Institute of Medical Sciences and research center Nashik of age group 19-22 after institutional ethical clearance. In the beginning, only all subjects participating in the study were informed and explained the purpose and method of the study and written informed consent was taken. The students were screened for respiratory parameters like respiratory rate, tidal volume(TV), expiratory reserve volume(ERV), inspiratory reserve volume(IRV), Inspiratory Capacity (IC), vital capacity(VC) and forced expiratory volume(FEV) expired at the end of first, second and third seconds of expiration as per standard guidelines and labelled as Group-I (before pranayama). The pranayama practice sessions (Anulom-vilom, Bhasrika, Kapalbhathi, Bhramari, Bahyakumbhak, and Agnisar,) were conducted with the help of and under supervision of a certified yoga trainer for the period of six months (4 days/week and 1 hour per day). There was no change in the routine diet plan. After completion of six months practice of pranayamas successfully, all the students were re-evaluated for the respiratory parameters and were labelled as Group-II (after pranayamas). The results and calculations were done by using an appropriate statistical test to find out the significance of various pranayamas with respiratory functions.

III. RESULTS

A total of 44 pre-obese individuals were further subjected to screen various respiratory parameters before and after pranayama practice (Table-1)

Table-1: Comparison of respiratory parameters

Variable	Before (mean ± SD)	After (mean ± SD)	P value
BMI	26.21 ± 0.46	24.30 ± 0.51	p < 0.002
RR (Breaths/min)	18.93 ± 0.45	15.98 ± 0.15	p < 0.003
TV (ml)	441.45 ± 3.61	449.55 ± 3.01	p < 0.003
ERV (ml)	1107.64 ± 2.41	1141.59 ± 2.71	p < 0.003
IRV (ml)	2496.05 ± 12.96	2538.05 ± 12.96	p < 0.003
IC (ml)	2937.50 ± 16058	2987.59 ± 15.98	p < 0.003
VC (ml)	4045.14 ± 18.99	4129.18 ± 18.69	p < 0.003
FEV1(%)	80.02 ± 0.15	85.02 ± 0.15	p < 0.003
FEV2(%)	91.02 ± 0.15	93.02 ± 0.15	p < 0.003
FEV3(%)	96.00 ± 0.00	97.02 ± 0.15	p < 0.003

BMI- Body Mass Index, RR- Respiratory Rate, TV- Tidal Volume, ERV- Expiratory Reserve Volume, IRV- Inspiratory Reserve Volume, IC- Inspiratory Capacity, VC- Vital Capacity, FEV(1,2,3)- Forced Expiratory Volume expired at the end of the first, second and third seconds of expiration.

IV. DISCUSSION

Pranayama has a very ancient origin in Hindu mythology. In modern times, its importance is increasing day by day due to its beneficial effects on body and mind ¹⁰. Kapalbhathi a kind of pranayama improves the functions of the respiratory system and has a direct association with the abdominal fat and the muscle and thereby significant reduction in the basal metabolic index.

In present study association of pranayama with respiratory parameters in pre-obese individuals found to be significant, in Respiratory Rate it was observed that before pranayama the RR: 18.93±0.45 breaths/min and after pranayama RR: 15.98 ± 0.15 breaths/min which is in concordance with the study carried out by T Pramanik et al¹¹.

The BMI of the subjects was significantly associated with respiratory parameters (before pranayama 26.21±0.46 kg/m² and after pranayama 24.30±0.51 kg/m²).

In a study carried out by Chandrashekhar M et al (2014)², reported that the vital capacity has increased from 2972±213.151 to 3372 ± 528.77, the tidal volume has increased from 496±84.063 to 588±150.88, expiratory reserve volume from 888±183.3 to 1096±386.73 which is in accordance with the present study.

In breathing exercises like Kapalbhathi, short powerful strokes of exhalation in quick succession with contraction of abdominal and diaphragmatic muscles train the subject to make full use of the diaphragm and abdominal muscles in breathing. It also helps in the removal of secretions from the bronchial tree, clearing up respiratory passages and the alveoli making room for more air.

V. CONCLUSION

The presents study concludes that the regular practice of pranayama is beneficial to respiratory functions by improving static and dynamic lung function. Pranayama decreases respiratory rate, increases various lung volumes & capacities and eventually beneficial to overcome obesity as it has a close association with abdominal muscles and thereby fat metabolism ². Hence pranayama is advisable to all healthy individuals for good health.

VI. REFERENCES

1. Kim D, Chen Z, Zhou LF, Huang SX. Air pollutants and early origins of respiratory diseases. *Chronic diseases and translational medicine*. 2018 Jun 1;4(2):75-94.
2. Chandrasekhar M, Ambareesha K, Nikhil C. Effect of pranayama and suryanamaskar on pulmonary functions in medical students. *Journal of clinical and diagnostic research: JCDR*. 2014 Dec;8(12):BC04.
3. Sengupta P. Health impacts of yoga and pranayama: A state-of-the-art review. *International journal of preventive medicine*. 2012 Jul;3(7):444.
4. Gupta A, Gupta R, Sood S, Arkham M. Pranayam for treatment of chronic obstructive pulmonary disease: Results from a randomized, controlled trial. *Integrative Medicine: A Clinician's Journal*. 2014 Feb;13(1):26.
5. Krishna BH, Pal P, Pal GK, Balachander J, Jayasettiaseelon E, Sreekanth Y, Sridhar MG, Gaur GS. Effect of yoga therapy on heart rate, blood pressure and cardiac autonomic function in heart failure. *Journal of clinical and diagnostic research: JCDR*. 2014 Jan;8(1):14.
6. Chaddha A. Slow breathing and cardiovascular disease. *International journal of yoga*. 2015 Jul;8(2):142.
7. Kumar N, Pradhan B. Immediate role of two yoga-based breathing technique on state anxiety in patients suffering from anxiety disorder: A self as control pilot study. *International Journal of Yoga-Philosophy, Psychology and Parapsychology*. 2017 Jan 1;5(1):18.
8. Ray US, Pathak A, Tomer OS. Hatha yoga practices: Energy expenditure, respiratory changes and intensity of exercise. *Evidence-Based Complementary and Alternative Medicine*. 2011;2011.
9. Raveendran AV, Deshpandae A, Joshi SR. Therapeutic Role of Yoga in Type 2 Diabetes. *Endocrinology and Metabolism*. 2018 Sep 1;33(3):307-17.
10. Roy B, Chatterjee S, Mondal S. Yoga and Vyayama: Traditional mind-body technique of ancient India.
11. Pramanik T, Sharma HO, Mishra S, Mishra A, Prajapati R, Singh S. Immediate effect of slow pace bhastrika pranayama on blood pressure and heart rate. *The Journal of Alternative and Complementary Medicine*. 2009 Mar 1;15(3):293-5.