International Journal of Yoga, Physiotherapy and Physical Education
ISSN: 2456-5067; Impact Factor: RJIF 5.24
Received: 28-01-2019; Accepted: 02-03-2019
www.sportsjournal.in
Volume 4; Issue 2; March 2019; Page No. 44-47

Short term effect of yoga on perceived stress and physical activity in obese perimenopausal women

Dr. Shradha Deshpande[1], Prachi Narkhede[2]
[1] Assistant Professor, MGM College of Physiotherapy, Kamothe, Navi, Mumbai, Maharashtra, India
[2] Intern, MGM College of Physiotherapy, Kamothe, Navi, Mumbai, Maharashtra, India

Abstract
Background: Perimenopause is defined as the two to eight years preceding menopause and one year following final menses. Sex hormones have a relationship between lung functions, stress levels and overall physical activity and hence it is important to study the effect of Yoga during Perimenopause.
Objective: To study the short term effect of yoga on perceived stress, physical activity and chest expansion in obese perimenopausal women.
Methodology and Material: A convenient sample size of 45 subjects was chosen. Pre assessment for BMI, Chest Expansion for all three levels (2nd, 4th intercostal space and xiphoid), using measuring tape, Physical Activity using International Questionnaire of Physical Activity (IPAQ) and Perceived Stress, using Perceived Stress Scale (PSS) was done. Subjects were undergone four weeks of Yoga programme, (1 hour/daily, 3 days/week) which included all asana and pranayama beneficial for perimenopausal symptoms. Yogic postures and pranayama practiced in first week for three days was been repeatedly practiced for next three weeks. Post intervention values were recorded for all the above mentioned parameters and compared with pre intervention values.
Results: Highly significant difference between pre and post values of Perceived Stress, Physical activity and chest expansion was seen where, ($p<0.05$ i.e. $p = 0.00$ for all the parameters).
Conclusion: This study proved that short term period of Yoga practice had significant effect on Perceived stress, physical activity and chest expansion at all three levels in Obese Perimenopausal women.

Keywords: ardha- matsyendrasana, perimenopause, perceived stress, physical activity

1. Introduction
Perimenopause is defined as the two to eight years preceding menopause and one year following final menses (WHO) [6]. Because the average life span of women in India has approached 62 years, the problems of perimenopause have attained a greater significance and the study of perimenopause is emerging as an issue [1].
Perimenopausal depressed women are more likely to report both negative life events and diminished self-esteem. Yoga, developed thousands of years ago, is emerging as a form of mind-body medicine. An Indian study observed a remarkable decrease (P=0.001) in the anxiety scores within 10 days of an educational yoga program for lifestyle modification and stress management [1].
Obesity is recognized as one of the most important underlying risk factors for a wide variety of diseases. Women are particularly prone to obesity, and approaches that address life transitions across the life span suggest that a number of factors may converge at passage points, such as perimenopause, that contribute to weight accumulation in the aging woman [2].
Perimenopause is associated with decrease in estrogen levels which is responsible for heart disease, osteoporosis, diabetes, hypertension and obesity in perimenopausal women are important public health concerns. It causes an increase in tendency to gain weight. There are several changes in the deposition and distribution of body fat from a gynoid to android pattern. Reduction in ovarian hormones at the perimenopause leads to diverse functional and endocronological disturbances resulting in decrease in basal metabolism and greater weight gain [3].
Leptin, a protein hormone produced mainly by the adipose tissue, is involved in body weight regulation and energy balance. Leptin is believed to be an anti-obesity hormone. The primary physiological role of Leptin is to communicate to the CNS about the abundance of available energy stores and to check food intake, induce energy expenditure and decrease weight. The absence of leptin therefore results in increased appetite and food intake that causes morbid obesity. Leptin also influences follicle stimulating hormone (FSH), Luteinizing hormone (LH), Adreno Cortico Trophic Hormone (ACTH), cortisol and Growth Hormone (GH) secretion. Significant differences have been reported in leptin levels between premenopausal and post-menopausal women decrease in estrogen level leads to increase in body fat and BMI [3].
Pulmonary function changes are associated primarily by aging but ovarian hormones also have certain impact on them. All sex-steroid hormones have been shown to be expressed in lung tissue. A new hormonal pattern is established at perimenopause which is characterized by a rise in circulating levels of follicle-stimulating hormone and luteinizing hormone and comparatively low level of estrogen and progesterone. Respiratory system undergoes various structural, physiological and immune changes with age. There is an increase in air space size with aging, resulting from the loss of supporting tissue. Loss of lung function occurs in perimenopausal women and respiratory muscle strength decreases with age. Several studies have reported about hyperventilation and bronchial relaxation

associated with high progesterone level during luteal phase of menstrual cycle and hence sex hormones play an important role in pulmonary functions [4].

Yoga, an ancient Indian science, aims to bring about functional harmony between body and mind through three main practices: asana, pranayama and meditation. Pranayama means control of 'prana'. "Prana" in Indian philosophy, refers to all forms of energy in the universe [5].

Pranayama helps in bringing conscious awareness to breathing and the reshaping of breathing habits and patterns [5].

The essence of the pranayama practice is slow and deep breathing which is economical as it reduces dead space ventilation. It also refreshes air throughout the lungs, in contrast with shallow breathing that refreshes air only at the base of the lungs. Thus, a yoga practitioner, through pranayama, can at some stage control other physiological functions and finally control manifestations of prana even outside the body [5].

2. Material and Methodology

A convenient sample size of 45 subjects was chosen on basis of the inclusion and exclusion criteria. Institutional approval was taken to conduct the study. A consent form was taken of all the participants who are a part of the study. A demographic data of the participants was collected. Pre assessment for Body Mass Index (BMI), Chest Expansion for all three levels (2^{nd} intercostal space, 4^{th} intercostal space, and xiphoid process) using measuring tape, Physical Activity using International Questionnaire of Physical Activity (IPAQ) and Perceived Stress using Perceived Stress Scale (PSS).Subjects were undergone four weeks of Yoga programme which included all the asana and pranayama beneficial for perimenopausal symptoms. There were total 12 sessions of one hour (60 minutes) in a month and three sessions per week. The Yogic postures and pranayama practiced in first week for 3 days was been repeatedly practiced for next three weeks. Every session started with warm up practice and ended with cool down practice.

Day 1: Started with Prayer followed by Om Pranava in Vajrasana (Thunder Bolt) position and later various asana were performed like Vajrasan for 1 min, Naman Mudra (3 repetitions), Padmasana (Lotus Pose) for 1 minute, Kapalbhatti, Ujjayi and Shitkari pranayama. Later Agnisar, Uthita Padasana (Raised leg posture) and Pawan Muktasana (Gas releasing posture) for 1 minute**,** Shavasan (Corpse position) for 5 minutes was practiced and session ends with Shanti Path.

Day 2: From Prayer till Shitkari pranayama the steps were same and later followed by Nauli Karma (Uddiyan) repetition 2-3 times, Bhujangasana (The Serpent Posture), Utthita-Pada Kati Vakrasana [Raised-Leg-Spinal-Twist Posture (Scissors)] and Ardha- Matsyendrasana (Half-Spinal-Twist Posture) for 1 minute. Session ends with Shavasan and Shanti path.

Day 3: From Prayer till Shitkari pranayama the steps were same and later followed by. Tadasana (The Palm Tree Posture), Utkatasan (The Chair Posture), Surya Namsakar (Salutation to the Sun) with the Following Ten Postures:

1. Urdhwa Namsakar Asana (salutation pose with arms raised)
2. Janushirsasana (head touching the knees pose)
3. Ekpada Prasarana (stretching one leg)
4. Dvipada Prasarana (stretching both the legs)
5. Ashtanga Namsakar (stretching with eight limbs of the body touching the floor)
6. Sarpasana (The Serpent Posture)
7. Bhoodharasna (Mountain Posture)
8. Ekpada Akarshana (Drawing one leg near)
9. Dvipada Akarshana (Drawing both the legs near)
10. Namaskara Poorvastiti (Back to original salutation posture)

The post intervention values were recorded for all the above Mentioned parameters and compared with the baseline values. The collected data was statistically processed using the SPSS software.

Inclusion Criteria

1. Obese Perimenopausal women within the age group of 45-55 years according to STRAW criteria.
2. Women who were willing agree to participate in Yoga program.

Exclusion Criteria

- Women using HRT (Hormonal Replacement Therapy).
- Women with chronic illness, severe metabolic and endocrine disorders.
- Women receiving any type of chemo/radiotherapy for any type of cancer.
- Women with any uro-gynecological surgeries e.g. Hysterectomy.
- Women having any neurological impairment, congenital conditions of the spine.

3. Results

The mean of all the above components has statistically highly significant difference between pre and post values of Perceived Stress, Physical Activity and Chest Expansion. Also there is significant difference in the p value where ($p<0.05$ i.e. $p = 0.00$).

Hence this study proves that even short-term period of Yoga practice has a significant effect on perceived stress, physical activity and overall pulmonary function in Obese Perimenopausal Women.

4. Discussion

On analyzing effect of 30 days regular practice of Yoga (asana and pranayama) in present study, it was found that there is a significant difference between the pre and post values of Perceived stress, Physical Activity and Chest Expansion at all three levels.

Due to voluntarily prolonging the phase of inhalation and expiration, respiratory muscles are stretched to their full extent and the respiratory apparatus is able to work to their maximum capacity [5].

In pranayama there is continuous phase of inhalation with strong voluntary control so that lungs are expanded considerably and walls of alveoli are stretched to maximum extent, thus chest continues to expand under cortical control [5]. As Pranayama is practiced, gradually respiratory system is acclimatized to withstand higher CO_2 concentration in alveoli and blood; Also subject keeps his voluntary muscles relaxed and immobile while at the same time exercising a close and continuous voluntary control over respiratory

muscle [5].

It helps in a major physiological stimulus for release of lung surfactant and prostaglandins in to alveolar space which increases lung compliance and cleanses lung secretions [5]. Breathing is regulated by Nervous system through respiratory centers located in Pons and Medulla Oblongata. Dorsal and Ventral groups of neurons, pneumotaxic centers and anapestic center. Activity of respiratory centers is modified by suprapontine influences in conscious being. Basic respiratory rhythm is maintained by dorsal group of neurons. Pneumotaxic center controls duration of inspiration and relaying suprapontine impulse which promotes breathing, Daily practice of Pranayama helps in basic activity of bulbopontine complex which adjust new breathing patterns and hence slower the respiratory rhythm [5]. Yoga has an overall calming effect on body and mind. Regular practice of OM chanting, Kapal bhatti and Ardha matsyendrasana reduces anxiety, depression, BP and anger as mind acquires stability [7].

Improvements in physical activity caused by Yoga seem to be related by

- Flexibility (Intense stretching and muscle conditioning increases skeletal muscles oxidative capacity and decrease glycogen stores.
- Muscular strength and endurance

Cardiorespiratory endurance and Pulmonary functions (Due to increase breath holding time and chest expansion) [9].

Yoga practice increases calcium stores from intestine, stimulate bone remodeling and maintain load bearing capacity. It also reduces back pain and headache by influencing limbic system modulation of endogenous pain control system [9].

Components like Perceived Stress and chest expansion in following study also plays an important role in improving Physical Activity.

5. Conclusion

- This study proves that short term period of Yoga practice has significant effect on Perceived stress, physical activity and chest expansion at all three levels. i.e. 2nd intercostal space, 4th intercostal space and xiphoid in Obese Perimenopausal women. And hence it should be practiced on regular basis.

Table 1: Final Results

	Perceived Stress	Physical Activity	Chest Expansion 2nd Intercostal space	Chest Expansion 4th Intercostal space	Chest Expansion Xiphoid
P value	0.00<0.05	0.00<0.05	0.00<0.05	0.00<0.05	0.00<0.05

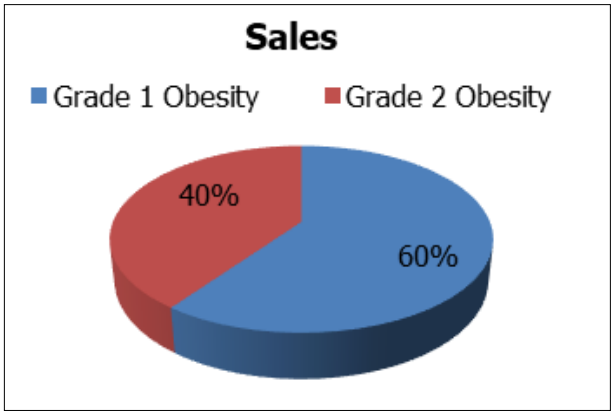

Fig 1: Pie chart showing BMI

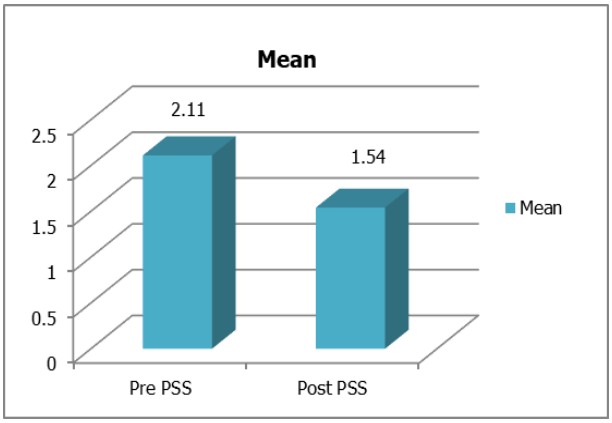

Fig 2: Perceived Stress Scale Score

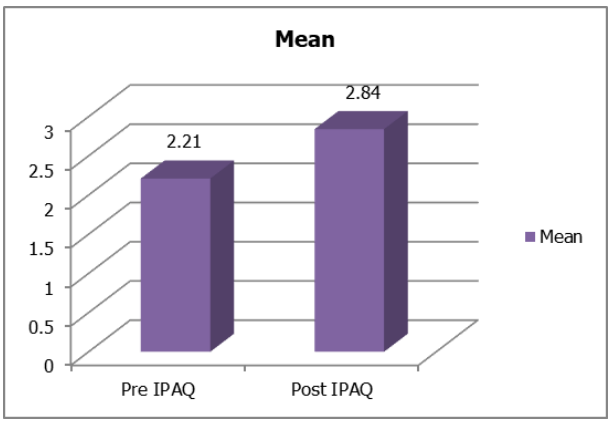

Fig 3: International questionnaire of Physical Activity

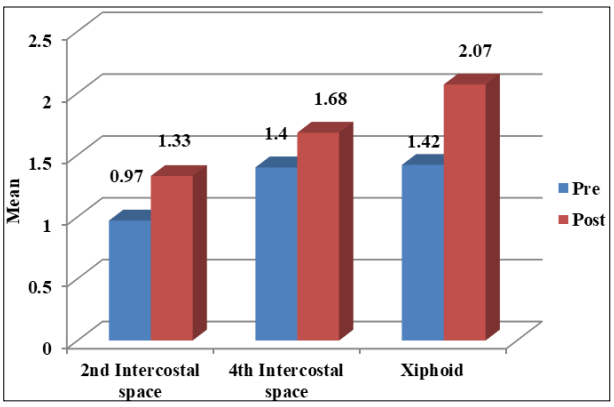

Fig 4: Chest Expansion at all three levels

6. Acknowledgment
We would like to extend our sincere gratitude to all the patients who were relentless and co-operative throughout the study. We would also like to thank the college principal and teachers who have been a big support in permitting us to undertake our study and for motivation.

7. References

1. Chattha Ritu MSc, Raghuram Nagarathna MD, FRCP, Venkatram Padmalatha FRCOG, MRCPI[3]; Hongasandra, Nagendra R. ME, PhD Treating the climacteric symptoms in Indian women with an integrated approach to yoga therapy: a randomized control study Menopause. 2008; 15(5):862-870doi: 10.1097/gme.0b013e318167b902
2. Milewicz A, Bidzińska B, Sidorowicz A. Perimenopausal obesity, Gynecological Endocrinology. 1996; 10(4):285-291. Doi: 10.3109/09513599609012322
3. Kaur H, Kochar R. ARC J Nutr Growth, pdfs. semanticscholar.org obesity and menopause a new nutritional concern, 2015.
4. Rajani Pagare S, Ratnaprabha B. Assessment of reference values of chest expansion among healthy adults in pune, india. Int J Physiotherapy Res. 2017; 5(1):1819-1823. DOI: 10.16965/ ijpr. 2016.197
5. Ankad RB, Ankad BS, Herur A, Patil S, Chinagudi S, Shashikala GV. Effect of Short Term Pranayama and Meditation on Respiratory Parameters in Healthy Individuals. International Journal of Collaborative Research on Internal Medicine & Public Health. 2011; 3(6):430-437.
6. Harlow SD, Gass M, Hall JE, *et al*. Executive summary of the Stages of Reproductive Aging Workshop + 10: addressing the unfinished agenda of staging reproductive aging. *Menopause (New York, N.y)*. 2012; 19(4):387-395. doi:10.1097/gme.0b013e31824d8f40.
7. Pundalik Ramchandra Nikam (Hathayogi Nikam Guriji), Swasthya Yoga Part 1 and 2, fifth edition at Ambika Yog Kutir, Thane, 2017.
8. Cramer, Holger, *et al*. Yoga in Women with Abdominal Obesity— a Randomized Controlled Trial. *Deutsches Ärzteblatt* International. 2016; 113(39):645-652. PMC. Web. 20 Mar. 2018.
9. Nayak G, Kamath A, Kumar P, Rao A. A study of quality of life among Perimenopausal women in selected coastal areas of Karnataka, India. J Midlife Health. 2012; 3(2):71-5.
10. Ankad Roopa B, Ankad Balachandra S, Herur Anita, Patil Shailaja, Chinagudi Surekharani, Shashikala GV S. Nijalingappa Medical College, Bagalkot, India Effect of Short Term Pranayama and Meditation on Respiratory Parameters in Healthy Individuals.
11. Gayathry Nayak, Asha Kamath, 1 Pratap Kumar, 2Anjali Rao. A study of quality of life among Perimenopausal women in selected coastal areas of Karnataka, IndiaJ Midlife Health, 2012.