Acta Biomedica Scientia

e - ISSN - 2348 - 2168
Print ISSN - 2348 - 215X

www.mcmed.us/journal/abs **Research Article**

THE IMPACT OF PRANAYAMA ON PHYSIOLOGICAL PARAMETERS AMONG ADULTS IN SELECTED AREAS OF HUTTI, RAICHUR DISTRICT, KARNATAKA

Annapoorna S[1], Dr. Gajanand R Wale[2]*

[1]Ph.D Research Scholar, Dept.of Nursing, Himalayan University, Itanagar, Arunachal Pradesh 791111, India.
[2]Research Guide, Dept. of Nursing, Himalayan University, Itanagar, Arunachal Pradesh 791111, India.

ABSTRACT

Stress is defined as a mental or emotional condition of strain or tension brought on by difficult or demanding situations. When an organism perceives a threat to its homeostasis, it responds with a variety of physiological adaptations that include endocrine, autonomic, and behavioral elements. Perceived stress has been proven in studies to have a deleterious impact on cardiovascular function by increasing blood pressure (BP) and decreasing cardiovascular responsiveness in participants. Stress has a negative impact on sleep quality. The present study was aimed to see how short-term pranayama practice affects stress perception, sleep quality, heart rate, and blood pressure. This was an interventional study in which participants were recruited from a selected area of Hutti with prior permission of the respective Office and consent from the selected adults between the age group of 30-40 years. Practicing pranayama for 20 days reduced stress, systolic and diastolic blood pressure, and increased sleep quality significantly (p0.05). The variations in heart rate were negligible (p=0.9). We also discovered that 10 (25.5%) of participants had a low stress perception, 27 (65.5%) had a moderate stress perception, and 2 (5%) had a high stress perception before starting the course. However, after 20 days of pranayama practice, 30 (75%) of subjects perceived low stress, 7.5(18.75%) moderate stress, and 1.5 (3.75%) high stress, as measured by PSS ratings. Our findings show that practicing pranayama reduced stress levels as judged by the participants, enhanced sleep quality, and decreased both systolic and diastolic blood pressures. These improvements were observed after practicing Pranayama alone, without the addition of other yogic practices, and after only a short period of time.

Keywords :- Pranayama, Physiological Parameters, adults.

Access this article online		
Home page: www.mcmed.us/journal/abs		**Quick Response code**
Received:22.08.2020	**Revised**:08.09.2020	**Accepted**:20.10.2020

INTRODUCTION

Stress is defined as a mental or emotional condition of strain or tension brought on by difficult or demanding situations. When an organism perceives a threat to its homeostasis, it responds with a variety of physiological adaptations that include endocrine, autonomic, and behavioral elements. Perceived stress has been proven in studies to have a deleterious impact on cardiovascular function by increasing blood pressure (BP) and decreasing cardiovascular responsiveness in participants. Stress has a negative impact on sleep quality. A growing body of data supports Yoga's effectiveness in lowering stress and, in some cases, reversing its negative consequences. Yoga is also being promoted as a supplement to medication for conditions such as hypertension and insomnia. Physical activities, breathing exercises, meditation, and relaxation techniques are all part of the yoga practice. Yoga has a variety of physical and mental health advantages, including stress reduction,

Corresponding Author:- **Dr. Gajanand R Wale** Email: gajanandrwale@gmail.com

anxiety reduction, depression reduction, somatic and mental hyper-arousal decrease, and improved sleep quality[1]. Pranayama, often known as breathing exercises, is a dynamic bridge between the body and the mind that involves the management of breath. The Sanskrit word "Pranayama" is made up of two words: "Prana" and "Ayama." Prana is a Sanskrit word that means "breath," "respiration," "life," "vigour," and "energy." Restraint, control, and regulation are all words that can be rendered as Ayama. Pranayama is a term that refers to the control of one's breath and/or energy. Puraka (inhalation), kumbhaka (retention), and rechaka (exhalation) are the three phases of pranayama, which can be done quickly or slowly[2]. Among all yogic practises, there is one that stands out. Pranayama is the easiest to learn and practice on a regular basis. The goal of this study was to see if pranayama done alone (without the addition of other yogic practices) has any tangible health advantages, notably in terms of stress, sleep, and other physiological parameters. If so, may these impacts be observed after only a short period of practice[3].

Aim and Objective:

To see how short-term pranayama practice affects stress perception, sleep quality, heart rate, and blood pressure.

MATERIAL AND METHODS:

This was an interventional study in which participants were recruited from a selected area of Hutti with prior permission of the respective Office and consent from the selected adults between the age group of 30-40 years[4]. Subjects were chosen based on a set of criteria, which are given below:

1. Participants who had never tried pranayama or other forms of Yoga.
2. Participants who suffered from anxiety issues.
3. Smokers, alcoholics, or adults who were addicted to drugs or alcohol.
4. Adults who were advised not to practice any such respiratory exercises or who were contraindicated for such act of Pranayama.

Participants who agreed to participate in the study signed a consent form. The adults general and medical histories were obtained. There was a physical examination. In the end, 40 people were included in the study. Male and female adults ranging in age from 30-40 years old were included in the study[5]. Before the actual training and practice began, a preliminary assessment of the subjects was conducted at the time of enrollment in the Pranayama course. The subjects were encouraged to rest for 10 minutes before their HR and blood pressure were monitored[6]. HR and BP readings were taken three times, 10 minutes apart, and the average of the two closest results was used. Sphygmomanometer and stethoscope were used to measure blood pressure. The “Perceived Stress Scale” and the “Pittsburgh Sleep Quality Index” questionnaires were given to each participant. Scale of perceived stress The PSS is the most extensively used psychological questionnaire for assessing stress levels. The questions answered are of a generic nature, with little information specific to any sub-population group, and query about feelings and thoughts in order to assess the "degree to which stressful situations in one's life are assessed," particularly over the previous month. The total score ranges between 0 to 40. Low stress is a score of 0-13, moderate stress is 14-26, and severe stress is 27-40. The Pittsburgh Sleep Quality Index measures how well people sleep in Pittsburgh (PSQI) The Pittsburgh Sleep Quality Index (PSQI) is a self-administered questionnaire that is used to assess sleep quality and sleep disorders in clinical populations. The PSQI asks participants to score their sleep quality and disruptions in the month leading up to the exam. The PSQI is a 19-item questionnaire that elicits information on sleep patterns, sleep disturbances, potential causes of sleep disturbances, sleep medicine use, overall sleep quality, daytime drowsiness, and vitality[7]. A global score of more than 5 indicates bad sleep, whereas a score of less than 5 indicates healthy sleep. The subjects subsequently began a 20-day course in which they practiced pranayama under supervision for two hours each day from 6 to 8 am.. The subjects were taught pranayama, and they practiced it under theobservation. The sessions included practicing different types of Pranayama such as anulomaviloma, mudra pranayama, merudhanda, dhavthi, and kapalabhathi, and each session was planned to include these techniques for specified durations of time across 7 cycles. As a result, all of the participants used the same approaches for the same amount of time, assuring consistency[8]. The subjects were assessed again at the conclusion of this time span. Their heart rate and blood pressure were measured using the same approach as before, and they completed the previously specified questionnaires. The data from before and after Pranayama were converted to mean and standard deviation, which were then statistically evaluated using the students' t test. Statistical significance was defined as a P value of less than 0.05.

Table 1: Comparison of Perceived stress, Sleep quality, heart rate and Blood Pressure in 40 subjects before and after the course of Pranayama

Parameter	Before course of Pranayama	After course of Pranayama	P value

PSS Course	17.00±5.71	7.6 ±6.62	0.01
PSQI Score	5.1 ±3.21	3.7±2.76	0.01
Heart rate (bpm)	78.84±9.11	80.0±8.06	0.93
SBP (mmHg)	127.52±17.36	116.28±10.32	<0.001
DBP (mmHg)	80.21±9.94	76.12±5.52	0.01

Diastolic Blood Pressure (DBP)
PSS stands for Perceived Stress Scale.
The Pittsburgh Sleep Quality Index (PSQI) is a measure of how well people sleep.
Practicing pranayama for 20 days reduced stress, systolic and diastolic blood pressure, and increased sleep quality significantly (p0.05). The variations in heart rate were negligible (p=0.9). We also discovered that 10 (25.5%) of participants had a low stress perception, 27 (65.5%) had a moderate stress perception, and 2 (5%) had a high stress perception before starting the course. However, after 20 days of pranayama practice, 30 (75%) of subjects perceived low stress, 7.5(18.75%) moderate stress, and 1.5 (3.75%) high stress, as measured by PSS ratings. Before practicing pranayama, 15 (37.5%) subjects reported poor sleep and 24 (60%) reported good sleep. As measured by PSQI ratings, 5.1 (12.75%) participants reported bad sleep and 32 (82.5%) reported satisfactory sleep after practicing pranayama[9].

DISCUSSION:

Our findings show that practicing pranayama for even a short period of time, such as 20 days, reduced stress, SBP, DBP, and increased sleep quality. It had no discernible effect on heart rate. The processes through which Pranayama produces these effects are unknown, just as the pathophysiological basis of stress and its negative consequences is unknown. The following can be deduced from the existing literature. By distorting basic neuro-endocrine mechanisms, the psychosocial stressors of modern life cause a variety of cardiovascular and other illnesses. The limbic system and hypothalamus, which control the autonomic nervous system, are activated by psychosocial stress. When this system is triggered, both sympathetic fibers and the adrenal medulla produce more adrenaline and nor-adrenaline, causing a rise in heart rate, systolic and diastolic blood pressures. Chronic exposure to psychosocial stimuli causes blood pressure to rise, coronary thrombosis to develop, and heart failure to occur. Psychosocial stress activates the hypothalamic center, which controls the pituitary adrenal axis, in addition to the sympatho adrenal-medullary system. Increased hypothalamic production of corticotrophin releasing hormone, which induces anterior pituitary release of adrenocorticotrophic hormone, which activates the adrenal cortex. As a result of the activation of the hypothalamus-pituitary-adrenal axis, plasma levels of glucocorticoids and aldosterone rise, causing salt and fluid retention, which increases blood volume and blood pressure, putting a burden on the heart. The negative impacts of these pressures on our bodies can be successfully mitigated by improving our bodies' adaptive mechanisms. In their study, Bodhi et al explained that a significant reduction in systolic blood pressure (SBP) was due to the following factors: decreased sympathetic tone, increased parasympathetic tone, decreased stress (lower baseline glucocorticoid level), increased plasma melatonin level, and mental relaxation. Satyanand et al. established in their study that practicing practicing and Bhramari pranayama helps to maintain normal blood pressure and reduce stress levels in daily life. According to certain research, consistent 5-minute Pranayama practice generates parasympathetic dominance in the cardiovascular system, resulting in mental calm and a reduction in stress levels in daily life.

The parasympathetic nervous system (PNS) is primarily responsible for resting HR, whereas DBP is a result of peripheral vascular resistance (PVR), which is mostly controlled by the sympathetic nervous system (SNS). DB decreases following pranayama, there is an increase in parasympathetic activity and a decrease in sympathetic activity. Pranayama breathing interacts with the neurological system, altering metabolic and autonomic systems, according to Sharma et al. Stretch of lung tissue produces inhibitory signals via slowly adapting stretch receptors, while stretch of connective tissue (fibroblasts) localized around the lungs generates hyperpolarization currents that propagate through neural and non neural tissues, causing synchronization of neural elements in the heart, lungs, limbic system, and cortex. Inhibitory current synchronizes rhythmic cellular activity between the cardiopulmonary center and the central nervous system, as well as regulating neural tissue excitability, which indicates a relaxed condition. Hyperpolarization of tissues causes changes in the parasympathetic nervous system. The parasympathetic response is primarily controlled by synchronization between the hypothalamus and the brain stem. The parasympathetic state is characterized by nervous system modulation and decreased metabolic activity. Pranayama can be done slowly or quickly. Slow pranayama breathing has more favorable effects, which could be because slow breathing has been observed to increase baro reflex sensitivity, lower sympathetic activity, and chemo-reflex activation in healthy patients. Furthermore, the highest cardio-ventilatory coupling is observed when

breathing frequency is reduced, as in slow pranayama breathing. Increased parasympathetic activity lowers resting heart rate, whereas lower sympathetic tone in skeletal muscle blood vessels lowers peripheral vascular resistance, resulting in lower DBP, MAP, and reduced work load on the heart, as well as better tissue perfusion. Our findings show that practicing pranayama reduced stress levels as judged by the participants, enhanced sleep quality, and decreased both systolic and diastolic blood pressures. These improvements were observed after practicing Pranayama alone, without the addition of other yogic practices, and after only a short period of time. Pranayama is simple to learn and practice. It doesn't necessitate any physical infrastructure. It is not physically taxing; therefore, it can be done by people of all ages and even those who are unable to engage in other forms of exercise due to physical constraints. Because of these qualities, pranayama is simple to include into one's daily practice. It can be used to improve general well-being and as a supplement to the treatment of a variety of medical diseases[10].

CONCLUSION:

Pranayama by itself, even when practiced for a short time, reduces perceived stress, improves sleep quality, and lowers blood pressure.

Limitations: Despite the positive results obtained with a small sample size of 40 people, the study should be replicated with a larger sample size. Subjects' stress levels and sleep quality were only assessed through self-reporting. For a more objective measurement, tools such as polysomnography and serum indicators of stress might be used.

REFERENCES

1. Robinson L, Segal R. (2016). Relaxation Techniques for Stress Relief. HelpGuide.org.
2. Nayak G, Kamath A, Kumar PN, Rao A. (2014). Effect of yoga therapy on physical and psychological quality of life of perimenopausal women in selected coastal areas of Karnataka, *India. J Midlife Health*. 5(4), 180-5.
3. Nayak G, Kamath A, Kumar P, Rao A. (2012). A study of quality of life among perimenopausal women in selected coastal areas of Karnataka, India. J Midlife Health. 3(2), 71-5.
4. Shobeiri F, Jenabi E, Hazavehei SM, Roshanaei G. (2016). Quality of Life in Postmenopausal Women in Iran: A Population-based Study. *J Menopausal Med*. 22(1), 31-8.
5. Mohammadalizadeh Charandabi S, Rezaei N, Hakimi S, Montazeri A, Taheri S, Taghinejad H, Sayehmiri K. (2015). Quality of life of postmenopausal women and their spouses: a community-based study. *Iran Red Crescent Med J*. 17(3), e21599.
6. Shin H, Shin HS. (2012). Measurement of quality of life in menopausal women: a systematic review. *West J Nurs Res*. 34(4), 475-503.
7. Shin H. (2012). Comparison of quality of life measures in Korean menopausal women. *Res Nurs Health*. 35(4), 383-96.
8. Borud EK, Martinussen M, Eggen AE, Grimsgaard S. (2009). The Women's Health Questionnaire (WHQ): a psychometric evaluation of the 36-item Norwegian version. *Scand J Psychol*. 50(2), 183-9.
9. Girod I, de la Loge C, Keininger D, Hunter MS. (2006). Development of a revised version of the Women's Health Questionnaire. *Climacteric*. 9(1), 4-12.
10. Benzineb S, Fakhfakh R, Bellalouna S, Ringa V, Hajri S. (2013). Psychometric properties of the Tunisian-Arabic version of the Women's Health Questionnaire. *Climacteric.* 16(4), 460-8.

Cite this article:
Annapoorna S, Dr. Gajanand R Wale. The impact of pranayama on Physiological Parameters among Adults in selected Areas of Hutti, Raichur District, Karnataka, *Acta Biomedica Scientia*, 2020, 7(2), 109-112.