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Physiology

KEY WORDS: Pranayama, Meditation, Computer, Stress, Hypertension

EFFECT OF PRANAYAMA AND MEDITATION OVER VITAL CARDIOVASCULAR RESPONSES ON PROFESSIONAL COMPUTER WORKERS

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ABSTRACT

New age cognitive demands, imposes a hell lot of psycho-physiological stress among computer workers. This work stress when combined with sedentary life style imposes a greater risk of developing hypertension in them. The purpose of this paper was to investigate whether regular practice of yogic pranayama and meditation for thirty minutes daily for a continuous period of six months can improve the vital cardiovascular status which found to be de-arranged due to different stressors in apparently young healthy computer professionals and after six months of study.

Summary - The regular practice of yoga for six months acts as a counter to the stressors and make a balance among autonomic nervous system which in turn maintains the basal vital parameters in the body especially under stress conditions.

INTRODUCTION

A rapidly growing part of the workforce use computers and the relative proportion of the working day spent in front of computers are increasing as well.[1] In general, computer work can be characterized by high visual and cognitive demands. Moreover, these cognitive demands often occur in combination with different psychological stressors. Epidemiological studies have implicated psychological stress as a risk factor for cardiovascular disorders.[2] The demand/control model of job strain suggests that jobs in which the demands are high and the control is low, combined with low social support are particularly stressful.[3] Furthermore, it has been indicated that stress can be induced by an imbalance between external demands and the individual's resources to meet those demands. [4] Cardiovascular disease has become a major cause of mortality in developing nations thus, good management of hypertension in India, one of the major contributors for cardiovascular diseases can lead to prevention of 3,00,000 of the 1.5 million annual deaths. By this year, disease burden of coronary heart diseases is predicted to rise to 120% in females and 137% in males in developing countries.[5] Major contributors for hypertension in corporate Indian adults are increased work stress, strict deadlines, high expectations, soaring competition.

Hypertension in computer professionals is related to work stress and sedentary life style.[6] Job stress is a chronic disease caused by conditions in the workplace that negatively affect an individual's performance and/or overall well-being of body and mind. Job stress may be caused by a complex set of reasons: i.e. job insecurity, high demand for performance, technology, workplace culture etc. When these professionals (especially computer) get project they ignore everything like food, sleep, entertainment etc. They only think how to do this project very efficiently and within time.[7]

Computer professionals have high growth needs and as such, researchers have suggested that they prefer to be involved in more work or projects so that they can acquire skills that are suited to an era of rapid technological change[8].

The significant advantage of yoga is to improve the physical and mental status of an individual. Exercise and meditation (yoga) are noted as a strategy resilient teacher use to maintain a healthy work-life balance [9]. The process of meditation improves the functioning of the prefrontal cortex (PFC) in the brain which includes the frontal lobes that control executive functioning, including cognitive functioning, decision making, social behavior and problem solving. The positive changes that occur include a decrease in blood pressure, heart rate and oxygen metabolism which supports the notion of meditation as a form of stress relief. The practice of yoga has been shown to reduce psycho-physiological indicators of mental stress in persons with high baseline stress levels associated with a physical disability, their social circumstances or their occupation.[10]

AIMS & OBJECTIVE:

The aim of present study was to investigate whether regular practice of yogic pranayama and meditation for six months can improve the vital cardiovascular status in these workers which found to be de-arranged due to different stressors in apparently young healthy computer professionals.

MATERIALS & METHOD:

Study Design: Interventional Cross Sectional Study.

Place Of Research: Department of Physiology ay Shyam Shah Medical College, Rewa (M.P.)

Study Period: 20th october 2019 to 20th April 2020 –6 months.

Study Subjects: Sixty Computer Professionals of median age group

Inclusion Criteria:

All Sixty Computer Professionals of median age group who are apparently healthy with no history of any cardiovascular diseases viz Hypertension

Exclusion Criteria:

Professionals on any major illness, drug or allergy history

METHODOLOGY:

The present study was conducted on sixty professional computer workers who were working in corporate set-up, performing computer works either related to software, hardware, data excel or regularized computer work. These computer professionals underwent thorough clinical examination in which especial emphasis was laid down on cardiovascular assessment. The cardiovascular assessment was all about measuring systolic blood pressure, diastolic

blood pressure and pulse rate firstly at resting basal condition and then after six months of Pranayama comprising both bhastrika and anulom-vilom and meditation. After accounting basal cardiovascular parameters of all the sixty subjects, they were underwent Bhastrika and Anulom-vilom Pranayama and meditation 30 minutes daily for the duration of 24 weeks, prior to this they were trained under the guidance of a certified "yoga" teacher. Comparing before and after the yogic training period the basal cardiovascular parameters comprising SBP, DBP and PR were found to be significantly reduced statistically by using student "t" test.

The data was collected and compiled and presented in form of Table.

RESULTS:

A total of sixty professional computer workers were included in the study. These professionals practiced Pranayama and meditation regularly thirty minutes daily for six months. The statistical analysis was carried out using student "t" test. It was observed that the mean Systolic Blood Pressure, mean Diastolic Blood Pressure and mean Pulse Rate shows statistically significant lowering after practicing Pranayama and meditation for six month period.

Table (1):

S.N.	Cardiovascular Parameters	Before Start of Study (Mean value with S.D.)	After six months of Pranayama and Meditation (Mean with SD)	P value
1.	Mean SBP (mmHg)	144.2 ± 6.33	123.1 ± 4.94	p<0.000
2.	Mean DBP(mmHg)	95.83 ± 5.62	78.83 ± 5.58	p<0.000
3.	Mean PR(per min)	75.7 ± 5.56	70.97 ± 4.87	p<0.000

DISCUSSION:

Prior research and industry reports have indicated that computer professionals often experience heavy workloads.[11] For de-stressing the stressors and to analyze the effect of Pranayama and meditation in various stress responses over cardiovascular system over computer professionals, this study was done where we observed the effect of six months practice of Bhastrika and Anulom-vilom Pranayama and meditation over Systolic and Diastolic Blood Pressure and Pulse rate in the study group. It was found that these professionals had increased mean range of Blood pressure and Pulse rate from recommended base level (p<0.000) which might be attributed to increase sympathetic activity of nervous system under the effect of stress and statistically highly significant. After six month of yoga the values of all vital cardiovascular parameters were decreased (p<0.000) which was statistically highly significant and occurs due to decrease sympathetic activity & increase parasympathetic activity of nervous system under the effect of yoga.

In the present study we observed that due to regular practices of Pranayama and meditation, mean systolic blood pressure, mean diastolic blood pressure and mean pulse rate were decreased due to autonomic equilibrium between sympathetic and parasympathetic nervous system and due to increase in vagal tone.[12]

Another study specifically on professional computer users were also shows similar results in which the cardiovascular, gastrointestinal, respiratory and other systems with autonomic mediation are included and resulted that physical and psychological symptoms have significantly decreased following ten weeks behavioral medicine intervention, with a greater reduction in those who were 'high somatizer's at baseline.[13]

Pranayama lead to lowering of respiratory rate, better supply of the oxygen by opening the alveoli in the lungs allowing the lung to absorb more oxygen, stronger diaphragm and removing impurities from the breathing tube. Practice of Pranayama is an art of controlling the breath and keeps attention on the act of breathing and removing attention from worldly worries and "de-stressing". This decrease release of adrenaline i.e. decrease sympathetic activity and hence decrease in heart rate, respiratory rate, blood pressure.[14]

Meditation relaxes body and focuses thoughts on one thing for a sustained period. This occupies mind, diverting it from the problems that are causing stress and provide the body a time to relax and recuperate, and to clear away stress hormones. Meditation is a useful and practical relaxation technique[15].

CONCLUSION:

This study describes an effect of Pranayama and Meditation on physiological parameters of stress. A significant reduction in all the considered physiological parameters is observed after the practice of yoga. We concluded that yogic Pranayama and meditation were beneficial for normalizing the blood pressure of computer professionals. The findings of the current study indicate that the computer professionals participating in a six month pranayama meditation (yoga breathing) course reported a decrease in perceived stress and felt more in control of their emotions. The benefits permeated into both their professional and personal lives influencing their approach to their work, engagement with staffs and clients and their exercise or relaxation routine. The workers also felt comfortable with the techniques and incorporated the strategies into their lessons, in an effort to encourage themselves to be more mindful and thus reduce behavioral problems in their working atmosphere. It can thus be concluded that these results would justify the incorporation of yoga as a regular part of life in prevention of hyper-reactivity to stress related disorders among computer professionals and thus the corporate society become more disciplined and fit physically, mentally, spiritually and financially.

REFERENCES:

[1] Jensen C. Development of neck and hand–wrist symptoms in relation to duration of computer use at work. Scand J Work Environ Health. 2003. 29(3):197–205

[2] Belkic K, Landsbergis P, Peter R , Schnall P, Baker D, Theorell T, Siegrist J, Karasek RA. Research findings linking workplace factors for CVD outcomes: psychosocial factors—review of the empirical data among men. Occup Med. 2000. 15:24–46

[3] Karasek RA. Job demands, job decision latitude, and mental strain: implications for job redesign. Admin Sci Quarterly. 1979. 24:285–307

[4] Frankenhaeuser M, Lundberg U, Augustson H, Nilsson S, Hedman H, Wahlstom K. Work, stress, job satisfaction. Swedish Work Environment Fund, RestaGrafiska, Stockholm. 1989. 1–20

[5] Stamler J. Blood pressure and high blood pressure-Aspects of risk Hypertension. 1991; 18:195–107.

[6] IANS New Delhi. 50% of IT staff unwell: Study. The Economic Times. 2009 Apr 7:Sect. Emerging Business & IT (col. 4).

[7] AbhaMisra. Globalization and stress among computer professionals. International Journal of Multidisciplinary Research and Development. 2015; 2(2):288-29

[8] Potosky D, Ramakrishna H. A Conceptual Framework for Predicting Career Success of IS Professionals, Proceedings of the 1998 SIGCPR Conference. 1998:174-179.

[9] Howard S, Johnson B. Resilient teachers: resisting stress and burnout. Social Psychology of Education. 2004; 7:399 - 420.

[10] Telles S, Srinivas RB. Autonomic and respiratory measures in children with impaired vision following yoga and physical activity programs. Int J Rehab Health. 1999; 4(2): 117–22

[11] Li EY, Shani AB. Stress Dynamics of Information Systems Managers: A Contingency Model, Journal of Management Information Systems. 1991; 7(4):107-130.

[12] Gharote ML. Effect of yogic training on physical fitness. Yoga mimansa. 1973; 15:31-35.

[13] Nakao M, Myers P, Fricchione G. Somatization and symptom reduction through a behavioral medicine intervention in mind/body medicine clinic. Behav Med. 2001; 26(4): 169–76

[14] Birkel DA, Edgren L. Hatha yoga: Improved vital capacity of college students. Altern. Ther. Health Med., 2000; 6:55–63.

[15] Wheeler A, Wilkin L. A Study of the Impact of Yoga asana on Perceived Stress, Heart Rate and Breathing Rate. *International Journal Of Yoga Therapy. 2007; 17:57-63*