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# Effect of Yogic Intervention on Blood pressure and Alpha- EEG level of working women

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The present study was aimed to find out the effect of Yogic intervention on working women blood pressure and Alpha- EEG level. There are many factors responsible for change in life and life style of women like biological, social and psychological. In the promotion of physical and mental health and prevention of many of these disorders, yogic practices are supposed to play a vital role. Yoga is an effective and time tested method for promote/improving our health as well as prevention and management of diseases. Fifty working women of age group 25-39 yrs selected from DAV Girls Degree College Yamuna Nagar (Haryana), and divided in to two groups, twenty five working women for experimental group and twenty five for control group. Before starting the practice both the groups control and experimental under went test for homogeneity of the groups. Control research design has been employed for the study. Practice time was 60 minutes each morning and the duration was 45 days. After 45 days again the post test has been taken for both the groups. The result of t-test revealed that the yogic intervention have significant effect at .01 level on blood pressure and Alpha- EEG level of working women age ranged from 25-39 yrs.

**Keywords:** Yogic intervention, Blood pressure, Alpha- EEG level

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According to a survey conducted by the Associated Chamber of Commerce and Industry (ASSOC-HAM), 68% of working women in the age bracket of 21-52 yrs were found to be afflicted with lifestyle ailments such as obesity, depression, chronic backache, diabetes and hypertension[1]. ASSOCHAM reports reveal that; 2/3of working women suffers from lifestyle diseases, 53% of them skip meals and go for junk food due to work pressure and deadlines. The report concluded that as 27% of females in urban India were employed, their health issues are a major concern both for society and business[2].

Yoga is a systematic discipline, originated in India, for self-realization. However, nowadays, Scientific researchers find its utility for all round development of personality along with innumerable spiritual as well as therapeutic applications. As per Indian tradition yoga, specialy *Hathayoga* comprises different yogic exercises, viz. *Asana* (body posture), *Pranayama* (controlled regulation of breath), *Bandha* (physiological locks or hold of semi-voluntary muscles), *Kriyas* (cleansing process), and *Mudras* (attitude which spontaneously arouses meditation).

Scientific researches on yoga have revealed that regular yoga practice improves physical fitness[3], physiological variables[4], and personality factors in Athletes[5], Cardio-respiratory Endurance[6,7] and peak flow rate[8]. The role of yoga in promotion, prevention and cure of disease like Asthma, hypertension has been established by the Scientific studies[9,10]. Yogic practices produce consistent physiological changes and have sound Scientific basis.

*Pranayama* introduces high pressures both in the central canal of the spinal cord and the ventricles of the brain. These pressures centrally stimulate the whole nervous system. Better functioning of nervous system, endocrine glands, circulatory, respiratory and digestive system through the practice of *pranayama* and vitalizing the human organism[11]. Yogis are capable of controlling their autonomic functions[12]. *Nadisuddhi pranayama* results in alteration of autonomic balance[13]. Proper ratio between the duration of *Purak*, *Kumbhak* and *Rechak* is maintained in order to condition the nervous system and other body

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function associated with the respiratory system[14], Shaktiganavel D. found significant changes in lungs vital capacity, heart rate and muscular endurance during practice of Pranayama[15]. Gore M M, found slight increase in peak flow rate due to practice of *Anulom-Vilom Pranayama*[16].

Yogic relaxation technique helps in reliving the stress[17], and it also helps to enhance required respiratory capacities and abilities in sports[18]. A reduction in blood pressure and Alpha- EEG levels in hypertensive patients found after continues for 12 months *Yoga Nidra* training[19].

Patricia *et al.* proposed as a method for healthcare professionals to encourage working women to develop a daily physical activity plan[20]. It is observed that yogic techniques are being applied in various fields such as management courses, industrial workers, police training, etc. A study related to effect of *yoga-sadhana*, i.e. yoga practices on quality of life and work efficiency of employed women done by khire Usha *et al*. the study reveals a positive effect of *yoga-sadhana,* i.e. *Asana*, *pranayama*, *Omkar*, *Yoga-Meditation* on quality of life of working women. However, the *yoga –sadhana* program has not been proved to be effective enough in bringing about a significant improvement in work efficiency. In her study researcher suggested need for a more comprehensive yoga program on a large sample[21]. Therefore, it is decided to plan a package of comprehensive yogic practices as yogic intervention to observe its effect on the working women.

## Methodology

The study was conducted to observe the effect of yogic intervention. Fifty working women of 25-39 yrs age groups were selected through quota sampling technique from DAV Girls Degree College Yamuna Nagar (Haryana) divided into two groups, 25 for experimental group and 25 for control group. A package of 60 minutes yogic intervention {*Gayatri Mantra*, *Pragya Yoga* for 15 minutes, *Yoga Nidra* for 30 minutes, *Nadi Shodhan Pranayama* 10 minutes**,** *Shanti patha* (5 minutes for *Gayatri mantra* and *Shanti patha*)} employed to all subjects of experimental group. The effects on the systolic and diastolic blood pressure and alpha electoenphalograph (EEG) level were studied. Before starting the practice both the groups, control and experimental, went through tests for homogeneity of the groups. To measure the Alpha EEG, Alpha EEG Biofeedback has been used which is the process of monitoring and displaying to an individual the ongoing Alpha EEG activity generated by his brain and Sphygmomanometer (with mercury) is the instrument which has been used to measure the blood pressure. In present study, researcher select some yogic practices like *Pragya yoga vyayama*[22](series of selected asanas), It included 16 step asanas series as 1- *Tadaasana*, 2- *Padahastasana*, 3- *Vajrasana*, 4- *Ustrasana*, 5- *Yogmudra*, 6- *Ardhatadasana*, 7- *Shasankasana*, 8- *Bhujangasana*, 9- *Tirykabhujangasana*(left), 10- *Tirykabhujangasana* (right), 11- *Shasankasana*, 12- *Ardhatadasana*, 13- *Utkatasana*, 14- *Padahastasana*, 15- *Tadaasana*, 16- *Balasana*. *Pragya yoga vyayama* is a yoga practice that made up of a variety of forward and backward bends. The series of movements stretch the spinal column and massage, tone and stimulate vital organs through alternately flexing the body forwards and backwards. Each posture was practiced with loud chanting of the syllables of *Gayatri mantra*. Second practice of intervention *Nadhi shodhan Pranayama*[23] is the alternative breathing process from left and right nostrils with *purak* (inhalation), *Rechak* (exhalation), *Kumbhak* (retention) and last practice *Yoga nidra*[24] a relaxation technique also the part of the intervention to observe the effect on working women. Practice of *Yoga nidra* is an important method of relaxation, which is practiced in the flat lying position of *Shavasana*. After 45 days of practice with the help of spoken instruction by yoga instructor again the post test has been taken for both the groups.

## Results and discussion

Hypothesis 1-Yogic intervention will significantly improve the systolic blood pressure of the subjects in the age group of 25-39 yrs. Table 1 shows the pre-post mean values and standard deviation of systolic blood pressure of the working women for experimental and control group, the hypothesis 1 has been proved on 0.01 level of confidence.

Hypothesis 2-Yogic intervention will significantly improve the diastolic blood pressure of the subjects in the age group of 25-39 yrs. Table 2 shows the pre-post mean values and standard deviation of diastolic blood pressure of the working women for experimental and control group, the hypothesis 2 has been proved on 0.01 level of confidence.

Hypothesis 3-Yogic intervention will significantly improve the Alpha EEG of the subjects in the age group of 25-39 yrs. Table 3 shows the pre- post mean values and standard deviation of Alpha EEG of the working women for experimental and control

Table 1—Effect of yogic intervention on systolic blood pressure (sbp) level between experimental group and control group

| Group | | Mean | SD | N | r | df | $SE_D$ | t-value | significance level |
|---|---|---|---|---|---|---|---|---|---|
| | Pre | 98.56 | 5.24 | 25 | | | | | |
| Experimental | | | | | | | | | |
| | | | | | 0.28 | 24 | 1.34 | 6.86 | 0.01 level |
| | Post | 107.76 | 4.77 | 25 | | | | | |
| | Pre | 98.64 | 4.99 | 25 | | | | | |
| Control | | | | | 0.94 | 24 | 0.99 | 0.24 | not significant |
| | Post | 98.40 | 5.29 | 25 | | | | | |

Table 2—Effect of yogic intervention on diastolic blood pressure (dbp) level between experimental group and control group

| Group | | Mean | SD | N | r | df | $SE_D$ | t- value | significance level |
|---|---|---|---|---|---|---|---|---|---|
| | Pre | 65.84 | 6.90 | 25 | | | | | |
| Experimental | | | | | | | | | |
| | | | | | 0.29 | 24 | 1.47 | 5.33 | 0.01 level |
| | Post | 73.68 | 3.03 | 25 | | | | | |
| | Pre | 65.52 | 6.88 | 25 | | | | | |
| Control | | | | | 0.93 | 24 | 1.37 | 0.11 | not significant |
| | Post | 65.68 | 6.54 | 25 | | | | | |

Table 3—Effect of yogic intervention on EEG level between experimental group and control group.

| Group | | Mean | SD | N | r | df | $SE_D$ | t-value | significance level |
|---|---|---|---|---|---|---|---|---|---|
| | Pre | 6.24 | 1.20 | 25 | | | | | |
| Experimental | | | | | | | | | |
| | | | | | 0.20 | 24 | 0.42 | 4.77 | 0.01 level |
| | Post | 8.12 | 1.50 | 25 | | | | | |
| | Pre | 6.72 | 0.93 | 25 | | | | | |
| Control | | | | | 0.10 | 24 | 0 .27 | 0.35 | not significant |
| | Post | 5.96 | 0.93 | 25 | | | | | |

group, the hypothesis 3 has been proved on 0.01 level of confidence.

The study shows a significant change in the systolic blood pressure level and in the diastolic blood pressure level of the subjects. An increased muscular activity during the *Pragya yoga vayama* requires increased blood supply for the oxygen and nutrients such as glucose. Waste products such as carbon dioxide, lactic acid, water and heat are to be removed rapidly from the muscles. Naturally the cardiac output is increased. The skeletal muscle arterioles are dilated due to sympathetic influence. The peripheral resistance is decreased and heart rate increased due to sympathetic activity increased then the parasympathetic activity. An increase in the arterial pressure stimulates the carotid sinus and baroreceptors at the aortic arch. These impulses reach to the medulla oblongata through afferent nerves. The cardiac center inhibits sympathetic activity and increase parasympathetic activity, which causes slowing down of the heart rate and dilation of the arterioles. As a result, the cardiac output is reduced and blood pressure turns to the normal level. Hence, the cardiac output as well as cardiac work load reduces; the systolic and diastolic blood pressure becomes normal which has been seen during the present study. *Shavasana* a part of *yoga nidra* produces considerable reduction in the activity of sympathetic Nervous system and catecholamine turnover leading gradually to maintain blood pressure[25]. During the state of concentration in *yoga nidra* parasympathetic activation and decreased Locus ceruleus (LC) stimulation of the para ventricular nucleus (PVN) of the hypothalamus also results in decreased baroreceptor stimulation and secondarily releases its inhibition of the supraoptic nucleus, leading to the release of arginine vasopressin (AVP) and makes BP return to normal[26]. Some previous finding also showed similar results[27,28,29,30]. *Pranayama* with autosuggestion and *Shavasana* activate parasympathetic activity of the body and

parasympathetic dominance decreases the arterial BP and the amplitude and rate of the heart beat. This helps to maintain the homeostasis inside the body[31].

As the previous studies show that *Yogic* practices which are the part of yogic intervention are significantly effective in normalizing the blood pressure; hence it supports the present study.

Yogic intervention causes significant effect on Alpha EEG level of female teachers in the age group 25-39 yrs. The study shows a significant change in the Alpha EEG level of all the subjects. *Pragya yoga vayama* helps organs and muscles to carry out their functions properly. Due to *Pragya yoga vayama* tonic enteroceptive impulses have far-reaching effects on behaviour giving stability and sense of well being. During the practice of *Nadishodhan pranayama* the cortical activity in relation with the intellectual planning, analysis, ego-consciousness and the thought process is greatly reduced to a minimal. It, therefore, appears that the rhythmic and proportionate as well as consciously controlled breathing through two nostrils alternately, brings about a harmony in the two oppositely working neural activities and establishes the balance in them. It brings tranquility and peace to the mind, making it more balanced and stable. The mind is better concentrated. The practice of *Yoga Nidra* is the intermediate stage of awakened and sleep and it is the stage of the brain when it produces Alpha waves. With the advancement of yogic intervention Beta activity was slowly replaced by Alpha activity and still further by smooth well formed Alpha activity. After the yogic intervention the alpha activity turns better. EEG measures minute electrical activity in the brain in the form of waves. The frequency of brain activity waves has been shown to alter according to the state of consciousness and state of mind.

## Conclusion

It can be said on the basis of this study that practices of the Yogic intervention which suggested in the study are significantly effective for Blood-Pressure and Alpha-EEG level. Women are the pillar of the society that's why if a woman is healthy than the society is healthy. With the help of modified life style with yogic intervention working women can maintain her health. Implication of this intervention may be use full for each and every age group. Working women who faced many physical and psychological problems can solve the problems with the help of suggested intervention.

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