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SCIENTIFIC ANALYSIS OF BHRAMARI PRANAYAMA ON PSYCHOLOGICAL VARIABLES AMONG MIDDLE AGED POLICE WOMEN – A RANDOMIZED CONTROL STUDY

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ABSTRACT
This study aimed to evaluate the effect of Bhramari pranayama on psychological variables, specifically sleep quality and self-confidence, among middle-aged police women. Forty female police personnel [ages 35-45] from Greater Chennai were randomly assigned to either a Bhramari pranayama (Bhr.P) group [n=20] or a control group [n=20] The Bhr.P group practiced Bhramari pranayama, consisting of 4-5 breaths per minute for 5 minutes followed by a 2-minute rest, repeating this cycle for 45 minutes, five days a week for 30 days. The control group engaged in active rest. Psychological profiles were assessed using the Pittsburgh Sleep Quality Index (PSQI) and Self-Confidence (SC) questionnaire, and statistical analysis using paired 't' tests indicated a significant [$p<0.05$] improvement in sleep quality and self-confidence in the Bhr.P group compared to the control group. These results suggest that Bhramari pranayama effectively improves sleep quality and self-confidence among police women and may be valuable for further clinical studies.

Keywords: Police Women, Bhramari Pranayama, PSQI, Self Confidence, Psychological tests

INTRODUCTION:

Yoga, which has its roots in ancient India, symbolises the union of the transcendental self with the individual self. An essential component of yoga is pranayama, which focusses on the connection between emotional states and breathing patterns [1]. Police officers are required by law enforcement authorities to deliver in a timely way. No leave or excuse is granted due to a poor state of health. Therefore, for improved law and order condition in society, physical and mental well-being are always necessary. Yoga based treatments have been shown to help police officers on duty have a healthy body, which in turn helps them develop a healthy mind [2]. Even through research has been done on some of Bhr.P's positive impacts, many of its other consequences are still unknown. This pranayama method, which involves deep breathing, lowers the physiological dead space ventilation and the effort required to breathe. It effectively uses the abdominal muscles and diaphragm, which enhances pulmonary function [3]. Yoga has its roots in ancient India and signifies the unification of the individual and transcendental selves. One significant component of yoga is pranayama, which primarily address the connection between emotional states and breathing patterns [1]. One such ancient yoga breathing technique is the bhramari pranayama, which not only involves a special breathing technique but also is linked to the simultaneous generation of a continuous humming sound during the expiration phase, which puts the body in a relaxed state [4,5]. This article attempts to get an understanding of the research done on the impacts of Bhramari Pranayama (Bhr.P), a subset of the yoga discipline, on human health. People may preserve their physical and mental health by practicing pranayama [6]. An Indian black bumble bee called "Bhramar" is the source of the Sanskrit term The Bhramari. "It explains the characteristic humming sound produced while exhaling during this breathing exercise. "Bhramari Pranayama is beneficial following neurosurgery and lowers anxiety, stress, anger, sleeplessness and depression." In Bhramari Pranayama, the forehead is squeezed to produce a larger amplitude vibration, the thumb closes the ear, and the fingers cover the eye. Thus, mental resonance is improved. In the brain, Bhramari creates vibrations. Specifically, the hypothalamus regulates the master or pituitary gland, receives impulses from the cerebral cortex through these vibrations [7].

METHODOLOGY

Study Participants

Participants were recruited from Greater Chennai Police, Chennai. Out of 110 participants screened, 40 were taken for the study, they fulfilled the requirements for inclusion. People who are willing to participate and show that they have given their informed permission by signing the written consent form are included in the study's inclusion criteria. The study specifically targets police women. The concerned individuals provided written informed consent. General examinations were conducted with personal history was completed. The exclusion criteria, which included

congenital heart conditions, wheezing, a history of acute sickness three months before to the research, recent surgeries, smoking, frequent exercise of any kind, participation in vigorous sports, and prior exposure to yoga training. Research done on Bhr.P in combination with any other practice was excluded. Police women who met the inclusion and exclusion criteria were chosen to participate in the study. A basic lottery approach was used to randomly split them into two groups: the control group (n=20) and the Bhr.P group (n=20). Participants in the control group received no pranayama at all. Analysis of data for psychological profiles for Pittsburgh sleep quality index (PSQI) and Self Confidence questionnaire. The pre-and post-test data were analysed using paired 't' tests. As instructed, the Bhr.P group practiced Bhr.P. Participants in the pranayama group were taught to do three to five breaths per minute for five minutes, followed by a two-minute break. In this manner, they were told to complete 10 cycles, each lasting forty-five minutes, five days a week, for a maximum of thirty days. The lessons were held online. Both the before and post test were administered, and table 1 shows the results of the statistical analysis.

Intervention Protocol:

In accordance with established procedure, the individuals were instructed in Bhr.P practice by certified yoga physicians [8]. They were told to close their eyes and stay in any comfortable sitting posture with their eyes closed, take a slow deep breath through each nostril and then release the breath as deeply as possible. They have to exhale softly vibrating the inner and laryngeal walls of their nostrils and by pronouncing the word "OM" with a buzzing nasal sound that resembled a wasp's sound. These actions finish one Bhr.P cycle, which consists of a respiratory rate of 3–4 beats per minute and a one-minute rest period. Thus, the individuals were forced every day of the week perfume the pranayama for a total of twelve weeks in the evenings between 3 and 4 p.m. Every time they performed the pranayama, they had to take three to six breaths per minute for five minutes, followed by a two-minute break. This was repeated five times, or five cycles, and was regarded as one cycle.

Statistical Analysis:

The data was presented as Mean ± SD using SPSS vers 19. The Bhr.P and control group were compared using a paired 't' test. A significance level of $p<0.05$ was established.

RESULTS:

Table1: independent 't' test mean and standard deviation calculations for the Bhr.P and control group before and after the test

Variables	Pre-Test			Post Test		
	YPG	CG	Independent t Test	YPG	CG	Independent t Test
	Mean and SD	Mean and SD	P Value	Mean and SD	Mean and SD	P Value
Self Confidence	39.7 (3.5)	40.2 (3.9)	t=1.1 p=.301	21.8 (3)	40.1 (3.1)	17.8 <0.001
PSQI	15.8 (1.7)	16.3 (2.2)	t=0.6 p=.535	9.7 (1.5)	15.9 (1.6)	9.4 <0.001

*At the 0.05 level of confidence

The table 1 shows the results of 't' test of Bhr.P group for study variable among middle aged police women. In the case of pretest and post-test (Bhr.P group), pretest of Bhr.P and control group shows no significant difference statistically whereas post-test of Bhr.P group shows statistically significant than the post test of control group in both the study variables.

Table 2: Effectiveness of Before and After test

YG			CG	
Variables	**E mean**	t and P value	**E mean**	t and P value
Self Confidence	-17.933	t=15.4	-0.133	t=0.3
	4.511	p=<.001	2.0656	p=.806
PSQI	-6.133	t=14.5	-0.466	t=1.1

	1.641	p=<.001	1.641	p=.290

*At the 0.05 level of confidence

The effectiveness of the Bhr.P group on self-confidence between the Bhr.P group (m=-17.93, S.D=4.51) and the control group (m=-0.13, S.D=2.06) shows that the t-value for Bhr.P group is 15.4 and in control group t=0.3, whereas the PSQI Bhr.P group (m=-6.13, S.D=1.64) and the control group (m=-0.46, S.D=1.1) shows that the t-value for Bhr.P group is 14.5 and the p value is <0.001 and in control group t=1.1 and p=.290. This show that here is a significant difference. Hence, it is proved that Bhr.P group improve in the study variable among middle aged police women.

DISCUSSION:

The purpose of the current study was to determine how well Bhr. P. practice impacted on police women psychological variables and showed a notable improvement. The Sleep quality index scale and self-confidence questionnaires scale was shown a noteworthy variation than the control group. A deeper breath really raises the amount of nor adrenalin, which echoes with exhale and functions as a hormone and neurotransmitter in the neurological system. This is because pranayama like Bhramari pranayama trigger the ANS reactivity. Using a biofeedback procedure, this released nor adrenalin then aids in lowering the levels of neuro hormones that result a variety of stressors, anxiety, and heightened mental states [7]. Deep yoga breathing causes the lungs to expand closer to their full capacity, which causes the alveolar gap to fill with surfactant ‘s and prostaglandins. This will decrease bronchial smooth muscle tone and increase ling compliance, which will raise lung volume and overall capacity [9]. The advantages of yoga for managing stress and endurance [10] are widely recognized. There is evidence that yoga and pranayama can help treat a number of lung conditions, such as cancer and TB. Likewise, a different investigation on the impact of the Bhr.P. intervention discovered a substantial rise in mental score following the intervention [t= (59) 5.60, p>.01] [7]. Additionally, this pranayama will support notable increases in mental and emotional well-being. It is recommended that further study be done to determine the therapeutic effects and provide the best standards for integrating pranayama into modern health and wellness practices. This RCT will yield more conclusive results if a comparable study with a bigger sample size and longer follow-up with the control group in a Randomized Controlled way is developed based on it. Psychological parameters were impacted by the 30-day intervention. The findings show that improving police officers' health and including yoga instruction will benefit law enforcement's most important human resources. The necessity of incorporating this into regular physical training for improved health is indicated by the significantly favourable post - Bhr.P intervention improvements and temporal trend patterns of those changes in police personnel's psychological metrics.

Strengths

The results are more credible because of our study's meticulous design, which includes stratified allocation, randomized controlled technique, and extensive outcome measurements. Potential confounding factors were reduced by using standardized intervention methods and qualified yoga teachers.

Limitations

Although encouraging, there are a few drawbacks that need to be noted. Cautious generalization is required due to the single-center design and somewhat limited sample size. Although the 30-days trial period offers initial data, longer-term follow-up research is necessary to demonstrate long-term effects.

CONCLUSION:

Strong evidence for Bhr.P. as a comprehensive solution for police women is shown in this study. This study shows that frequent Bhr.P practice enhances the psychological function of police women in good health. To support the results, more research including a bigger sample size and longer follow-up is necessary.

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