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Effect of yoga based techniques on stress and health indices using electro photonic imaging technique in managers



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ABSTRACT

Background: Meditation techniques are known to elicit relaxation response in which moving meditation which combines the practice of yoga postures and guided relaxation is known as Cyclic Meditation reported helpful in reducing the sympathetic arousal and improving health of practitioners.

Objectives: The objective of this study was to investigate the effect of Cyclic Meditation on stress and health indices in managers as measured by Electro Photonic Imaging (EPI) technique.

Materials and methods: EPI technique was used to assess participants before and after 35 min of Cyclic Meditation (CM) and equal duration of Supine Rest (SR) session. A total of sixty six male managers, age ranges from 35 to 60 years (mean \pm SD 53.97 \pm 5.96) were included in the study. EPI parameters, including Activation Coefficient, Integral Area left and right and Integral Entropy, left and right were taken for statistical analyses.

Results: Cyclic Meditation has produced a highly significant reduction in stress level, whereas this reduction was not found significant within SR group. There was a significant improvement in health index 'Integral Area' values in both left and right sides within the CM group while only IA right side showed a significant improvement within the CM group. The integral entropy value right side decreased significantly within the CM group, whereas IE left was found deteriorated within the SR group. Moreover, only IE left side has shown a significant difference between the groups.

Conclusion: The investigations in this study suggest that Cyclic Meditation practice reduces stress and improves psychosomatic health indices more effectively than Supine Rest in managers.

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1. Introduction

ElectroPhotonic Imaging (EPI) technique based on Kirlian effect is a scientific method to assess stress in individuals [1]. The assessment through EPI is performed through stimulation of electrons at the finger tips by applying a short electric pulse of a high voltage (10 kv), high frequency (1024 Hz) and low current for less than a millisecond [2]; then a glow occurs. This glow is the consequence of ionization of gaseous molecules in the surrounding air through the discharged electrons from the finger tips; this glow is captured by a CCD-camera and is known as electro-photonic image [3]. These EPI images are obtained from all 10 fingers of

both the hands in two ways, with filter and without filter. A filter is a specially designed thin plastic film placed between the finger and the dielectric plate during assessment. It eliminates sweat effects due to sympathetic (psychosomatic) responses and obtains only the parasympathetic (or physiological functional state of the person) response [4]. Comparison of these images acquired with and without filter forms a parameter called Activation Coefficient, which is a quantitative assessment of stress level of a person, based on evaluation of autonomic balance [5]. The experimental data correlating the findings of EPI measures with heart rate variability [6], systolic and diastolic pressures [7] and the stress level [8] suggest that EPI can be used to measure the activity of autonomic responses.

EPI also provides two more important components. The first is Integral Area (IA), which is a measure of the general health index of the person being investigated [5,9]. The second constituent is

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known as Integral Entropy (IE), which is a measure of chaos/disorder in the energy pattern of human energy systems [10]. EPI provides a non-invasive, painless and almost immediate evaluation of health abnormalities [8]. Therefore, the applications of the EPI method are gaining high significance in various fields of medicine, psychology, consciousness, sports and material testing in more than 63 countries worldwide [1]. Further, the EPI readings in healthy people vary only 8%–10%, which is a clear indication of a high level of reliability of this technique [5]. The EPI Camera Pro and compact instrument made by Kirlionics Technologies International, Saint-Petersburg, Russia were used for assessment.

1.1. Cyclic Meditation

Cyclic Meditation (CM) is a yoga based relaxation method. The foundation for CM is from Mandukya Upanishad [11]. The verse emphasizes that the human mind is either in agitation or in drowsiness states; with this in focus, the CM concept was developed. CM practice is to stimulate the mind when it is drowsy and to pacify the mind in case of agitation and to maintain the settled mind in perfect equilibrium [12]. These two cyclical phases of the mind can be altered at one's own will. Studies have found that the asana phase of the CM is associated with sympathetic activation, whereas relaxation phase with parasympathetic activation [13]. Many of the meditation practices yield a relaxation response, where the moving meditation practice which combines a practice of asanas (yoga postures) and guided relaxation known as 'cyclic meditation' has been found more effective in reducing physiological arousal in comparison with Supine Rest (SR) [13,14]. The effect of CM has been studied using many tools and instruments in both ways, objectively and subjectively. The documented findings showed that CM reduces occupational stress, autonomic arousal, reduces anxiety, oxygen consumption, P300 peak amplitude, improves memory, attention, sleep and quality of life [14]. CM is an efficient relaxation technique which provides immediate effect and may be carried out 'on the spot' for achieving a quick relaxation response.

In the present study, we have compared the CM practice with an equal duration of Supine Rest 'SR' (*Shavasana*). It is evident that the CM practice reduces autonomic arousal, and the EPI technique measures autonomic functions; however, there is no such study which applies EPI technique to study the effect of CM. Thus, the current experiment is aimed at investigating the effect of CM on stress and health indices using EPI technique.

2. Material and methods

2.1. Study protocol

One hundred and fourteen managers participated from a series of programs called Self Management of Excessive Tension (SMET) which is conducted periodically at S-VYASA University, Bangalore, India. All the participants were from three companies in India viz., Hindustan Aeronautics Limited (HAL), Oil and Natural Gas Corporation (ONGC) Limited and Canara Bank.

Inclusion: Age ranges 30–60 years males, managers (having lifestyle related health issues), and willing to participate in the study.

Exclusion: People with cut in fingers and absent fingers, undergoing any other wellness strategy and those who have smoked or taken alcohol or substance abuse on the day before the measurement were excluded.

Ethical consideration: The protocol was approved by the Institutional Ethics Committee. A written informed consent was

obtained from all participants before the assessment, and their confidentiality was maintained.

2.2. Interventions

2.2.1. Cyclic Meditation (CM)

The basis of this Cyclic Meditation is stimulation followed by relaxation, which gives profound rest in periodic cycles. Previous studies have used the CM practice which lasts for 22 min and 30 s [14]. Present study involves 35 min of CM practice, divided into 8 steps. Step-1: Opening prayer (1 min), the practice began with lead and follow of verse from a yoga text, the *Mandukya Upanishad* [12]. Step-2: Instant Relaxation Technique (IRT, 1 min), it is done by isometric contraction of the muscles of the body and ends with supine rest. Step-3: Centering (4 min); coming to standing position to *Tadasana* with both feet planted firmly on the ground. Step-4: Standing posture called *Ardhakatichakrasana* (6 min), from *Tadasana* bending towards the right (1 minute and 30 s); a gap of 1 minute and 30 s in *Tadasana*, then bending towards the left (1 minute and 30 s); a gap of 1 minute and 30 s in *Tadasana* again. Step-5: Quick Relaxation Technique (QRT, 5 min), in the Supine Rest (SR) with guided instructions and ends with the chanting of AAA (*A-Kara*) with an open mouth. Step-6: Sitting Postures, *Vajrasana*, *Shashankasana* and *Ushtrasana* (6 min), coming to *Vajrasana* (1 min), bending forward (*Shashankasana*, 1 minute and 30 s) a gap of 1 minute and 30 s in *Vajrasana*, bending backward (*Ushtrasana*, 1 minute and 30 s); a gap of 1 minute and 30 s. Step-7: Deep Relaxation Technique (DRT, 10 min) slowly coming to the supine position for further relaxation of different parts of the body in a sequence as per instructions. Step-8: Closing Prayer (2 min), the practice is concluded with a prayer for the welfare of one and all.

2.2.2. Supine rest (SR)

The second group was given an equal duration of 35 min of SR in which participants simply lay down on the mat in the corpse posture (*Shavasana*). This is done with eyes closed, hands away at half feet from the body, palms facing upwards, legs apart at one and half feet distance and adopting a comfortable posture for 35 min.

2.2.3. Procedure

The study had two groups: control design in which the Cyclic Meditation was compared with the same duration of Supine Rest (*Shavasana*). To find out the reproducibility of the stress reduction, four independent studies were conducted on CM and another four on SR. Participants completed a baseline assessment, comprising self-reported measures of health status. EPI readings were carried out before and after 35 min of interventions, with 10 min for pre assessment and 5 min for post assessment. Thus the total session was for 50 min. For easy follow up during post readings, all participants were given a sequence number so that they can stay relaxed until post measurement. It could be done easily with the help of a few volunteers. Readings were taken from all 10 fingers of both the hands in two ways, with a filter (WF) and without filter (NF) during the pre-assessment, whereas only without filter during post assessment. It was earlier observed that 'with filter' changes of EPI parameter were found to be consistent over a short duration [5]. Therefore, WF data from pre assessment was kept as a baseline to compare both NF pre and NF post data. This comparison of 'with filter' data with 'without filter' data provides Activation Coefficient (AC) parameter values. This method was adopted since the immediate effect of an intervention sustains only for a short duration. Thus, it was required to complete the post assessment as soon as possible after the intervention so that the real effect could be measured. Finally, Activation Coefficient, Integral Area, left and

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