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Cognitive Neuroscience 2020: Modulating Neural Functions Sleep Quality and Level of Consciousness through Meditation- JPN Mishra- Central University of Gujarat, India

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Introduction:
The system of Preksha Meditation (PM) is originated from Jain Canonical literature which is based on "Perception of Thoughts". It is imbued with spiritual powers that cleanse the mind and body of negative energy, and thereby facilitate the improvement in various sensory and motor functions of brain, reduces level of stress, enhances the sleep quality and level of consciousness. The purpose of this study was to assess the efficacy of PM on adolescent post-graduate students by measuring parameters related to psychological status, neurological functions, sleep quality and level of consciousness. Intense meditation practices help to achieve a harmony between body and mind. Meditation practices influence brain functions, induce various intrinsic neural plasticity events, modulate autonomic, metabolic, endocrine, and immune functions and thus mediate global regulatory changes in various behavioral states including sleep. This brief review focuses on the effect of meditation as a self regulatory phenomenon on sleep.
Meditation practices have been a life style practiced in India thousands of years ago. Proficient meditative practices help to integrate the brain functions, regulate various physiological mechanisms resulting in a state of mental and physical well being. Studies of long term transcendental meditation (TM) practitioners have shown that TM helped to achieve a state of "restful alertness" a state of deep physiological rest which was associated with periods of respiratory suspension without compensatory hyperventilation, decreased heart rate, heightened galvanic skin response along with enhanced wakefulness. This restful alertness and hypometabolic state were believed to be the outcome of physiological and biochemical changes brought about by meditation practices.

Meditation has become popular in many Western nations, especially the USA. An increasing body of research shows various health benefits associated with meditation and these findings have sparked interest in the field of medicine. The practice of meditation originated in the ancient Vedic times of India and is described in the ancient Vedic texts. Meditation is one of the modalities used in Ayurveda (Science of Life), the comprehensive, natural health care system that originated in the ancient Vedic times of India. The term "meditation" is now loosely used to refer to a large number of diverse techniques. According to Vedic science, the true purpose of meditation is to connect oneself to one's deep inner Self. Techniques which achieve that goal serve the true purpose of meditation. Neurological and physiological correlates of meditation have been investigated previously. This article describes the process of meditation at a more fundamental level and aims to shed light on the deeper underlying mechanism of the beneficial effects associated with meditation. Research on the effects of meditation is summarized.

Objectives: Four components of PM were applied on 50 adolescents. The assessment parameters viz. alpha brain waves, sleep duration, component of REM and Non-REM, Sleep spindles; awareness subjectivity, and state of awareness; neurotic reactions, anxiety level, mental ability, fear and emotional level were applied. The effect of meditation on sleep was first reported by Mason et al. in practitioners of TM. The main objective was to evaluate the neurophysiological correlates of the higher states of consciousness during sleep. The study reported that the senior meditators spent more time in the slow wave sleep (SWS) with higher theta–alpha power with background delta activity, together with reduced electromyogram (EMG). The rapid eye movement (REM) sleep was also found to be enhanced. The distinct theta–alpha pattern observed during sleep was considered as an electrophysiological correlate of a stabilized state of higher consciousness in sleep. Further, the study opened up new avenues to explore the influence of meditation on sleep.

Results: The experimental participant students exhibited significantly enhanced number of alpha brain wave omission and reduced level of stress hormones in blood, which led them to remain in state of relaxation. Total Non-REM duration of sleep was found increased with significantly improved sleep quality too, with greater awareness. They were having reduced fear, frustration and anxiety level and emotionally well balanced.

Conclusions: Synchronization of brain waves with alpha waves predominating may be correlated with deep relaxation associated with better sleep quality and improved psychological state.

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