
Yoga and Meditation for Psychological Growth & Wellbeing

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ABSTRACT

Yoga is a holistic science of universal applicability and adaptability. Although originated in India, Yoga and meditation are being practiced throughout the world. The rather consistent and wide range benefits and applications of yoga and meditation led numerous multi-disciplinary researchers to conduct research in these areas. A summary of important and relatively recent research done at the international and national levels related to yoga and meditation related to neuroimaging, cognition and perception, wellbeing, depression and higher states of consciousness is presented in this article.

Keywords: Yoga, Meditation, Psychological Wellbeing, Cognition, Neuroimaging

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Yoga is a holistic science of universal applicability and adaptability. Although originated in India, Yoga and meditation are being practiced throughout the world. The rather consistent and wide range benefits and applications of yoga and meditation led numerous multi-disciplinary researchers to conduct research in these areas. A summary of important and relatively recent research done at the international and national levels related to yoga and meditation related to neuroimaging, cognition and perception, wellbeing, depression and higher states of consciousness is presented in this article.

Neuroimaging Psychological studies

Neuroimaging psychological studies on yoga and meditation revealed significant variations in the brain structures and functioning, highlighting cognitive and perceptual changes. Manna et al., (2010) researched on Theravada Buddhist monks using neuroimaging devices and found that expert meditators control cognitive engagement in conscious processing of sensory-related, thought and emotion contents, by massive self-regulation of fronto-parietal and insular areas in the left hemisphere. Their study suggests that a functional reorganization of brain activity patterns for focused attention and cognitive monitoring takes place with mental practice. Several other international studies too found changes in the brain centers of yoga and meditation practitioners related to attention, perception, and cognition which they termed as higher order functioning (eg., Froeliger, Garland, Modlin, & McClernon, 2012; Pagnoni & Cekic, 2007; Slagter, Lutz, Greischar, Francis, Nieuwenhuis, Davis, & Davidson, 2007). Studies on EEG were utilized to explore the state of mind pre and post yoga/meditation. The abundance and location of slow to fast electrical brain waves (delta, theta, alpha, beta) provide a good indication of brain activity, which was identified in a study conducted by Lagopoulos et al. (2009). Meditation has high impact on the brain waves and it is observed that the emotion identification and state of mind can be observed through EEG data.

Santhi Kriya, a specialized technique developed by Yogacharya Raparthi Rama Rao, is a mixture of combined yogic practices of breathing and relaxation. Preliminary attempts were made to determine the effect of Santhi Kriya on certain psychophysiological parameters (Satyanarayana, Rajeswari, Rani, Krishna, & Rao, 1992). The volunteer's body weight, blood pressure, oral temperature, pulse rate, respiration, ECG and EEG were recorded before and after the practice on the 1st day and subsequently on 10th, 20th and 30th day of their practice. They were also given a perceptual acuity test to know their cognitive level on the 1st day and also at the end of the study i.e., on the 30th day. Results indicate a gradual and significant decrease in the body weight from 1st to 30th day (P less than 0.001) and an increase in alpha activity of the brain (P less than 0.001) during the course of 30 days of Santhi Kriya practice. Increase of alpha activity both in occipital and pre-frontal areas of both the hemispheres of the brain denotes an increase of calmness. Rao (2011) reviewed some of the empirical research on the neurophysiological correlates of meditation highlighting some methodological shortcomings and conceptual problems and suggested areas of promise for further research on meditation.

The auditory sensory pathway was studied in meditators (Telles, Singh, Naveen, & Subramanya, 2014), using midlatency and short latency auditory evoked potentials. The results suggested that meditation facilitates the processing of information in the auditory association cortex, whereas the number of neurons recruited was smaller in random thinking and non-meditative focused thinking, at the level of the secondary auditory cortex, auditory association cortex and anterior cingulate cortex. In a similar study (Telles, et al., 2012) there were prolonged latencies of 2 MLAEPs components, the Na and Pa waves during meditation suggesting that auditory information transmission at the level of the medial geniculate and primary auditory cortex (ie, the neural generators corresponding to the Na and Pa waves) was delayed.

Cognition and Perception

Research on mindfulness meditation, which is a mental state achieved by focusing one's awareness on the present moment, while calmly acknowledging and accepting one's feelings, thoughts, and bodily sensations revealed changes at the cognitive, perceptual and emotional levels. Garland, Gaylord and Park (2009) stated that mindfulness is a metacognitive form of awareness involving the process of decentering, a shifting of cognitive sets that enables alternate appraisals of life events. Mindfulness training also led to improved memory for positive information among a community sample (Roberts-Wolfe et al., 2012). Beyond its effects on memory, mindfulness training may also promote positive reappraisal. By enhancing positive affect and cognitive flexibility, mindfulness practice may promote reappraisal of stressors according to Hanley, Garland, and Black (2014). In their study, a sample of 118 meditation practitioners completed an online survey comprising assessments of the prevalence and frequency of mindful reappraisal, as well as measures of well-being and distress. The results of their study showed that regular use of mindful reappraisal was significantly correlated with years of meditation practice.

Another study (Garland, Gaylord, Fredrickson, 2011) tried to explore the cognitive mechanisms underlying stress-reductive effect of mindfulness practice. They conducted a prospective observational study of 339 participants (mean age 45.7 ± 13.4) undergoing an 8-week mindfulness-based stress and pain management course and found that positive reappraisal and mindfulness appear to serially and mutually enhance one another, creating the dynamics of an upward spiral. It is suggested that through mindfulness practice, individuals may engender a broadened state of awareness that facilitates empowering interpretations of stressful life events, leading to substantially reduced distress. Greeson (2009) summarized that both basic and clinical research indicate that mindfulness is associated with less emotional distress, more positive states of mind, and better quality of life and that it long-term practice can influence the brain, the autonomic nervous system, stress hormones, the immune system, and health behaviors, including eating, sleeping, and substance use.

A randomized controlled trial (Telles, Singh, Bhardwaj, Kumar & Balkrishna, 2013) assessed the effects of yoga or physical exercise on physical fitness, cognitive performance, self-esteem, and teacher-rated behavior and performance, in school children and found

improvement on certain cognitive and physical fitness parameters. In a cross-sectional study comparing the cognitive performance of meditators and non-meditators in the geriatric age group, Prakash, et al. (2012) found that long-term *Vihangam* Yoga meditators have superior cognitive abilities than non-meditators in the old age group. This technique should be studied further for its ability to prevent age-related cognitive decline. The randomized controlled trial (Telles, et al., 2013) assessed the effects of yoga or physical exercise on physical fitness, cognitive performance, self-esteem, and teacher-rated behavior and performance, in school children. They found that general and parental self-esteem improved in the yoga group and suggest that yoga and physical exercise are useful additions to the school routine, with physical exercise improving social self-esteem.

Psychological Wellbeing

Numerous studies showed improvements in psychological wellbeing through practice of yoga and meditation. In the longitudinal study by Chandler and Alexander (2005) meditation led to post-conventional self-development. In a meta-analytical study, Sedlmeier et al., (2012) performed a comprehensive overview of the effects of meditation on psychological variables that are extracted from empirical studies, concentrating on the effects of meditation on nonclinical groups of adult meditators. Results were strongest (medium to large) for changes in emotionality and relationship issues, less strong (about medium) for measures of attention, and weakest (small to medium) for more cognitive measures. The effects on cognition and quality of life were assessed in a randomized, controlled, six-month trial of yoga in healthy seniors (Oken et al., 2006). Participants were randomized to 6 months of Hatha yoga class, walking exercise class, or wait-list control. Subjects assigned to classes also were asked to practice at home. Those in the yoga group showed significant improvement in quality-of-life and physical measures compared to exercise and wait-list control groups but there were no relative improvements of cognitive function among healthy seniors in the yoga or exercise group compared to the wait-list control group.

Wood (1993) researched on the effects of three different procedures viz., relaxation, visualization and pranayama, on perceptions of physical and mental energy (vitality) and on positive and negative mood states in a group of normal volunteers. Pranayama produced a significantly greater increase in perceptions of mental and physical energy and feelings of alertness and enthusiasm than the other two procedures. Qualitative data regarding factors affecting health other than the therapy and benefits of the service were analyzed using content analysis in a group of patients who participated in yoga and/or dance programs (Selman, Williams, & Simms, 2012). The participants reported psycho-spiritual, physical and social benefits and improved well-being was clinically significant for yoga. Murphy and Lahtinen (2015) conducted semi-structured interviews from participants of Mindfulness Based Cognitive Therapy program revealed themes that offer support to the assertion that mindfulness meditation helps facilitate a different mode of meta-cognitive processing with which to handle depression-related cognitions. A 10 week on yoga intervention stress, anxiety, and quality of life scores improved over time and yoga was found to be more effective than relaxation in improving mental health (Smith, Hancock, Blake-Mortimer, & Eckert, 2007). Recently, Garland and

Fredrickson (2013) proposed a theoretical model to explicate how mindfulness might stimulate upward spirals of positive affect and cognition. Meditation is found to evoke a metacognitive state of broadened awareness with downstream effects on affect and cognition. Garland, Geschwind, Peeters, & Wichers, (2015) used experience sampling method and found that daily positive affect and cognition are maintained by an upward spiral that might be promoted by mindfulness training.

Sharma, Gupta, and Bijlani (2008) explored the short-term impact of a comprehensive but brief lifestyle intervention, based on yoga, on subjective wellbeing levels in normal and diseased subjects. Normal healthy individuals and subjects having hypertension, coronary artery disease, diabetes mellitus or a variety of other illnesses were included in the study. The outcome measures were 'subjective wellbeing inventory' scores, taken on the first and last day of the course. There was significant improvement in the subjective wellbeing scores within a period of 10 days as compared to controls. They suggested that a short lifestyle modification and stress management educational program leads to remarkable improvement in the subjective wellbeing scores of the subjects and that yoga can make appreciable contribution to primary prevention as well as management of lifestyle diseases. Enhanced wellbeing amongst engineering students through *nadishodhan* pranayama (alternate nostril breathing) training (Joshi, Singh, Singla, & Joshi, 2011) was observed.

Kumar and Telles (2009) found that focusing on the symbol OM in Dharana may favorably influence selective attention, concentration, visual scanning abilities, and a repetitive motor response compared to other sessions. Cyclic meditation was compared to an equal duration of supine rest in the corpse posture (shavasana) on state anxiety and the performance in memory tasks, to see whether they would change after the practice. The study (Subramanya & Telles, 2009) results suggest that movement as a part of cyclic meditation may actually facilitate performance in attention and memory tasks more than an equal duration of time in a conventional relaxation posture (shavasana). Malathi and Damodaran (1999) conducted a study on first MBBS students to determine the benefit of yogic practices on anxiety status during routine activities and prior to examination. Anxiety status showed a statistically significant reduction following practice. In addition the anxiety score which rose prior to exams showed a statistically significant reduction on the day of exam after practice. The results of the exam indicated a statistically significant reduction in number of failures in yoga group as compared to the control group suggestion impact on attention and probably cognition. The improvement in various parameters such as better sense of wellbeing, feeling of relaxation, improved concentration, self-confidence, improved efficiency, good interpersonal relationship, increased attentiveness, lowered irritability levels, and an optimistic outlook in life were some of the beneficial effects enjoyed by the yoga group indicated by feedback score.

Transformation

The methods of yoga and meditation provide opportunities for overall transformation. Only few studies explored this area at a holistic level. A narrative approach was adopted by some of the studies in order to explore such changes. Some studies focused on personal

narrations (e.g., Braud, 1995; Cardena, Lynn, & Krippner, 2000; Kennedy & Kanthamani, 1995). Forman (1998) discussed personal experiences along with discussion of the experiences of others. Newborn (2002) gave a personal account of how yoga can teach survivors to live through a physical and emotional crisis and pointed out that a new consciousness can develop and then tragedy can transform itself. This process will eventually lead survivors from a confusing state to a clear understanding of all elements of their lives.

Research on transcendental states of consciousness indicated that it may produce beneficial physiological, psychological, and behavioral effects expected to be associated with higher stages of human growth (Alexander et al., 1990). Seth et al (2008) argue that both subjective and objective measures are to be used in a combined manner to study consciousness. According to them, an advantage of subjective measures is that the conscious status of a range of mental states can be assessed, including both knowledge content and phenomenal content. They suggest that new studies need to combine multiple measures, both behavioural and brain based. Yoga and meditation are undertaken as means of self-transformation (Garrett, 2001) and may not only be adopted as 'magical' ways of achieving personal aims, but they also have the potential to take practitioners beyond the ego towards 'sacred' understandings or 'otherness'.

According to Bhusan (1998), by exerting proper control over the modifications of the mind, the yoga and meditation practitioner succeeds in eliminating negative thoughts and feelings, develops a harmonious personality and acquires equanimity resulting in transformation. Although there are very few studies that explore how actually this transformation happens, more recently, Suneetha (2014) worked on transformation of yoga and meditation practitioners using qualitative method. She identified that the internal process of meditation initiated meditative replays of past troubling life events, which helped them overcome negative feelings and emotions and to clarify cognitions. Meditative and non-meditative spiritual experiences of 31 practitioners following different spiritual traditions have been explored and identified (Suneetha, 2012). Qualitative data from the subjects is collected by way of semi-structured interviews. The spiritual experiences of the subjects, their impact and the transformative changes in them were collected. Ninety three spiritual issues are traced from the data. A total of twenty spiritual experience themes are formed from the issues identified in the data. The transformative changes over a period of time due to regular spiritual practice that the spiritual practitioners shared included changes in behavior, body, cognitive capacities, general, health, habits, worldview (thinking), personality, social, work related, and shifting of focus.

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