



## ***Yoga for Rehabilitation: an overview***

**Dr. Shirley Telles**

Joint Director, Research, VYASA International, Bangalore

*Dr. Shirley Telles completed the M.B.B.S. degree in 1984 from Goa Medical College (Goa) and subsequently M.Phil in Neurophysiology (1987) and Ph.D. in Neurophysiology (1992) from the National Institute of Mental Health & Neurosciences, Bangalore. From 1992 till the present she is at the Vivekananda Yoga Research Foundation, Bangalore as the Deputy Director of Research and she is also the Chief Investigator of some research projects. She has 59 publications in international journals. She also has written 5 chapters in books, published 3 books and attended several conferences at the national and international level as an invited speaker and has been a guide for the PhD degree by Bangalore and Mysore Universities. She is a reviewer for 5 international and 3 national journals. Her awards include a Young Scientist award of the Indian Science Congress Association for the physiology section (1991), the Shakuntala Amir Chand award of the Indian Council of Medical research for young scientists (1993), a Fulbright Fellowship to study 'Functional magnetic resonance imaging in meditators' at the Dept. of Radiology, University of Florida and an award from The John Templeton Foundation, USA for an essay on 'Creative research ideas in Neurobiology'*

Yoga is an ancient Indian science and way of life, which influences the functioning of the brain and the rest of the body. Several studies have shown that the practice of yoga has a definite role in the promotion of positive health, including mental health, characterized by improved cardio-respiratory efficiency, autonomic responses to stressors, sleep, muscular endurance, and 'higher' brain functions. The practice of yoga has been used in rehabilitation. A one-year controlled trial showed that yoga practice improved the functioning of mentally challenged children, in three aspects, viz., their motor co-ordination, social interactions, and IQ. Also, the practice of yoga reduces psycho-physiological signs of stress (e.g., rapid, irregular respiration) in children with impaired vision and in adolescent girls under legal custody at a State remand home. There were also improvements in chronic schizophrenics practicing yoga, in terms of better bodily awareness and flexibility of thinking. Finally practicing yoga was found to promote positive physical and mental health in persons over the age of sixty, those staying in a community home and in persons with work related stress.

In the last three decades researchers have attempted to study the role of yoga in promotion of health, prevention of disease and in understanding states of consciousness. This brief report summarizes the studies conducted to explore the use of yoga in rehabilitation, at Swami Vivekananda Yoga Research Foundation, Bangalore.

### **The mentally challenged and Schizophrenics:**

Forty five mentally challenged children who underwent one year of an integrated yoga therapy program (consisting of breathing exercises, loosening exercises, suryanamaskar,



yogasanas and meditation) were compared with forty five mentally challenged children who followed their school routine. The significant improvement in IQ, motor co-ordination and social adaptation in the children who practiced yoga, suggests the role of yoga in the management of mentally challenged children (1).

Yoga was also evaluated in the rehabilitation of community dwelling chronic schizophrenics. A one year follow up study on 11 chronic schizophrenics showed that there were fewer fluctuations in the skin resistance (SR) following yoga. To begin with, all 11 patients were 'hyper responders' who were reported to have positive symptoms. Fewer fluctuations in SR are interpreted as a 'stabilizing effect'. This suggests that yoga, if practiced with close supervision and support has both objective and subjective benefits (e.g., a sense of calmness) for schizophrenics (2).

#### **Community home girls:**

Another application of yoga was for socially disadvantaged adolescent girls. 28 community home girls under legal custody were shown to have autonomic and respiratory signs of greater arousal, anxiety and fear (3). They were randomly assigned to two groups [yoga and games]. At the end of an hour daily for six months both groups showed a decrease in breath rate and a non significant increase in skin resistance. Another study comparing community home girls trained in yoga or sports with regular school girls showed higher optical illusion and lower critical flicker fusion frequency in community home girls trained in physical activity than those who were trained in yoga (4). These results suggested that yoga improved perceptual ability. The two studies demonstrated the beneficial effect of yoga for community home girls.

#### **Visually Impaired:**

Blindness at an early stage of development has been found to modify non-deprived sensory modalities, as a compensatory measure. Earlier studies using evoked potentials have suggested that posterior brain areas normally involved in vision participate in auditory selective attention in the blind. Hence the three following studies evaluated the effect of early rehabilitation in the blind on auditory information processing. Recordings of middle latency auditory evoked potentials on blind children (with early rehabilitation) and matched controls showed significantly lower peak latency of the Nb wave (5) and P1 wave (6). Also, there was a significantly lower peak latency of the Nb and Pa wave in blind children who did not receive an early rehabilitation (7). These results suggest that information processing at the level of the ascending reticular activating system and Heschl's gyrus may occur efficiently in the blind. Another study was conducted to evaluate the state of physiological arousal in the blind, which is believed to be high due to the loss of sensory cues. This study also investigated the role of yoga compared to physical activity in reducing stress and anxiety related to daily living skills and navigation.



Autonomic and respiratory variables studied on 28 blind children and 28 age-matched normal sighted children showed signs of higher physiological arousal in children with impaired vision compared to children with normal sight. In the second part of the same study, 24 blind children were randomly assigned to yoga and physical activity groups. Both groups spent an hour each day practicing yoga or physical activity depending on their groups for 3 weeks. The significant reduction in breath rate in the yoga group demonstrated marginal reduction in arousal (8), suggesting that yoga can be a part of the daily routine in the rehabilitation of the blind.

**Occupational stress:**

**Work related stress:**

The effect of yoga on occupational stress was studied. In the first study, 26 asymptomatic, male, middle managers were evaluated for the physiological changes of a yoga based stress management program (9). At the end of the program there was a significant reduction in the breath rate. There was also a decrease in breath rate, peak power of low frequency component of heart rate variability, ratio between low frequency and high frequency and an increase in the high frequency peak power in the subjects whose 'occupational stress index' was greater than the median. These results suggest that following a yoga based stress management program subjects with higher levels of occupational stress who do not necessarily show raised sympathetic arousal at baseline, show significant reduction in sympathetic activity. The second study was on normal volunteers studied in two sessions of yoga based guided relaxation and supine rest. 15 subjects were assessed for autonomic variables and 25 subjects were analyzed using oxygen consumption and breath volume (10). A significant decrease in oxygen consumption and increase in breath volume were recorded after guided relaxation. There were comparable reductions in heart rate and skin conductance during both guided relaxation and supine rest. During guided relaxation there was a reduction in low frequency component, ratio between the low and high frequency and increase in the power of the high frequency component of the heart rate variability spectrum. The above results suggest that sympathetic activity decreased after guided relaxation based on yoga.

**Professional computer users:**

Somatic indicators of distress (11) and critical flicker fusion (CFF) frequency (12) were assessed in two hundred and ninety one professional computer users with ages between 21 and 49 years, who were randomly assigned to two groups, yoga (YG, n=146) and wait-list control (WL, n=145). The participants were from a software company in Bangalore city (India) and they all used a computer for more than six hours each day, for five days a week. All of them had normal health based on a clinical history and examination. Both groups had comparable job assignments and responsibilities as rated by the human resource personnel from the



software company. Both groups were assessed at baseline and after sixty days. At the end of sixty days there were 62 persons in the YG group and 56 in the WL group. There was a significant decrease in somatic indicators of stress and improvement in increase in CFF frequency in the yoga group.

#### **Geriatric population:**

69 elderly subjects belonging to both genders who were residing in a home for the aged were stratified and randomly allocated to three groups viz., yoga, ayurveda and wait-list control groups. They were assessed using the Geriatric Depression Scale (short-version) and the Sleep Rating Questionnaire, before and after six months of their respective interventions (yoga and ayurveda), while the wait-list control group followed their normal routine. The results suggest that the yoga group showed a significant reduction in the depression scores (13) and improvement in the self rated quality of sleep (decreased time taken to fall asleep, increased number of hours slept each night and improved feeling of being rested in the morning) (14) while the Ayurveda and Wait-list control group showed no change.

Hence yoga has diverse applications in rehabilitation of the mentally challenged, patients with chronic schizophrenia, community home girls, visually impaired persons, geriatric population and persons with work related stress.

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