Meditation has been shown to reduce stress and increase feelings of peace and calm (Oman, et al., 2008). This suggests several applications and possible benefits related to practicing meditation. One of them is possibly an improvement in sleep. This assumption may be made based on the fact that real-world stress influenced cardiorespiratory functions during sleep, hence influencing the restorative function of sleep (Sakakibara, et al., 2008). In keeping with this, meditation techniques have been found to improve the quality of sleep, though this was chiefly based on subjective measures (Winbush, Gross & Kreitzer, 2007).

The association between sleep and meditation has been of interest and an early study actually showed that experienced practitioners of Transcendental Meditation (TM) spent appreciable parts of meditation sessions in sleep stages 2, 3, and 4 (Pagano, et al., 1976). However, this did not further the understanding about whether practicing meditation can actually alter the sleep structure. A more recent study on TM practitioners, using standard polysomnography did attempt to answer this question (Mason, et al., 1997). There were eleven long term practitioners, nine short term practitioners, and eleven non practitioners. While there were no significant differences between groups in standard sleep measures, visual inspection of slow EEG records did show specific differences between the groups for the first three cycles of stages 3 and 4 slow wave sleep. Long term practitioners had significantly greater theta 2-alpha 1 relative power than the other two groups. In this report the increased theta-alpha activity co-existing with delta activity of deep sleep was interpreted as suggestive of the practitioners having reached periods of transcendental consciousness.
Changes in sleep architecture related to the practice of meditation were described in another study (Sulekha, et al., 2006). Meditators were categorized as young (with ages between 20 and 30 years) and middle – aged (ages between 31 and 55 years). Comparisons were made with age-matched non-meditators. Middle-aged practitioners of two types of meditation techniques [viz. Vipassana and Sudarshan Kriya Yoga (SKY)] spent 12.0 percent of time in slow wave sleep (S3 and S4) compared to age matched non-meditators, who spent 3.7 percent of time in those stages. Vipassana meditators also spent significantly more time in rapid eye movement (REM) sleep compared to SKY meditators and non-meditators. The study was interpreted as suggesting that yoga practice helps to retain slow wave sleep and enhance the REM sleep state in middle-aged meditators.

The recovery experiences during leisure time, sleep, and affect the next morning are inter-related (Sonnetag, Binnewies & Mojza, 2008). Psychological detachment from work on the preceding day predicted negative activation and fatigue the next morning, whereas mastery experiences during the evening predicted positive activation, while relaxation predicted serenity. Also, the quality of sleep showed a relation with all affective variables. The results hence suggest that events on a particular day impact the quality of sleep at night and the affect the following day. Various factors of diverse behavioral and chemical origins are known to influence sleep (Jurkowski & Bobek-Billwicz, 2007). Among the well recognized factors are sleep deprivation and high intensity exercise (Dworak, et al., 2007).

In persons with sleep-onset and/or sleep-maintenance insomnia, as well as those with primary or secondary insomnia, eight weeks of yoga practice improved the sleep
efficiency, total sleep time, total wake time, sleep onset latency, and the wake time after sleep onset (Khalsa, 2004).

Also, a combination of yoga practices (i.e., physical postures, voluntarily regulated breathing, relaxation techniques, and lectures on yoga philosophy), improved the self-rated quality of sleep in older persons, compared to a group receiving an ayurveda poly-herbal preparation and another wait-list control group (Manjunath & Telles, 2005). The following benefits were self-rated by the older participants after six months of yoga practice viz., a decrease in the time taken to fall asleep, an increase in the total number of hours slept and in the feeling of being rested in the morning.

Among yoga techniques, meditation particularly has been shown to reduce stress and increase feelings of calm (Oman, et al., 2008). Meditation in fact, forms the sixth and seventh stages of the eight limbs (astanga) described by the sage Patanjali [Patanjali, *circa* 900 B.C.] (Taimini, 1986). While many practitioners do learn meditation directly, others find it easier to pass through the other stages, learning yoga postures (asanas) and regulated breathing (pranayamas), first (Nagendra & Nagarathna, 1997). For those who find it difficult to commence the practice of meditation there are two possible risks. Some people may find that they feel drowsy and even fall asleep other people may have a series of thoughts rushing through their minds preventing them getting into a meditative state. For this reason a technique of ‘moving meditation’, which combines the practice of yoga postures with guided meditation was devised, called cyclic meditation (CM), by H.R. Nagendra, Ph.D., which is conducive to getting into a meditative state. This technique has its’ origin in an ancient Indian text, *Mandukya Upanishad* (Chinmayananda, 1984a). It is interesting to note that CM does induce a quiet state of mind, which is compatible with
the description of meditation (*dhyana* or effortless expansion), according to Patanjali. This description states that ‘*Tatra pratyayaikatanata dhyanam*’ (Patanjali’s Yoga Sutras, Chapter 3: Verse 2). This means that the uninterrupted flow of the mind towards the object chosen for meditation is *dhyana* (Taimini, 1986). Indeed, all meditations, irrespective of the strategies involved are believed to help reach this state. There are several strategies in meditation. These include breath awareness, awareness of internal sensations, directing the attention to a *mantra* or a *koan*, and keeping the eyes open with the gaze fixed on the object of meditation, among other methods.

This technique i.e., CM consists of recurring cycles of physical postures (*asanas*) and supine rest in a meditative state of mind. In normal volunteers cyclic meditation practice reduced psychophysiological arousal based on a decrease in oxygen consumption (Telles, Reddy & Nagendra, 2000; Sarang & Telles, 2006a); and changes in the heart rate variability suggestive of a shift towards vagal dominance (Sarang & Telles, 2006b). Despite these changes suggestive of reduced physiological arousal, practitioners performed better in a cancellation task requiring selective attention (Sarang & Telles, 2007) and showed an increase in the P300 event related potential amplitude following the practice (Sarang & Telles, 2006c), also suggestive of enhanced sustained and selective attention.

More directly a two-day yoga program which involved the practice of cyclic meditation decreased occupational stress levels and baseline autonomic arousal (Vempati & Telles, 2000). Specifically, when participants were categorized based on the occupational stress index (OSI) at baseline, those with high OSI levels showed a decrease
in breath rate and a change in the heart rate variability suggestive of vagal dominance, while those with low OSI levels to begin with showed no change.

There have been studies which have shown that day time stress influences the sympathetic/parasympathetic balance during sleep. For example, reduced parasympathetic activity, based on the heart rate variability was recorded during sleep in the symptomatic phase of severe premenstrual syndrome (Baker, Colarin & Trinder, 2008).

Hence, considering that (i) day time activities influence sleep, including the level of parasympathetic activity during sleep, and (ii) cyclic meditation is a relatively easy to learn technique which influences the heart rate variability, with specific changes associated with the levels of mental stress and cyclic meditation appears to help in stress reduction and since stress influences sleep the present study was designed to compare the effects of practicing cyclic meditation in the day time with the effects of supine rest practice, on the heart rate variability during sleep and to study whether practicing cyclic meditation would influence the sleep structure in normal persons.