

# Improving Sleep Quality through Heartfulness Meditation- Technical Aspects and Benefits

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## ABSTRACT

Sleep is a vital function of the body that is essential for our physical and mental well-being. In today's world, sleep deprivation is becoming a major epidemic affecting both men and women across all age groups.

Globalization and explosion of information through Internet, ever increasing competition in this capitalistic world and endless social engagements have led to an accelerated lifestyle in majority of the societies, consequently reducing the time to rest and sleep.

Poor sleep affects all ages in terms of attention, concentration, learning, memory, creativity, productivity, emotional stability and physical health. Inadequate sleep is known to impair health and shorten the lifespan.

A good quality sleep enhances memory, mood, immune system and fights infection, keeping mind, heart and blood vessels healthier. Sleep regulates several hormonal functions and autonomic nervous system and thus improves health.

Currently available drugs to treat sleep disorders have many adverse effects ranging from dependence, tolerance, day time sedation and risk of Alzheimer's disease etc. There is a growing interest in complementary therapies like meditation as an alternative to drugs in this regard.

Meditation has been shown to improve the quality of sleep and also positively affect different medical conditions that are known to produce sleep disturbances, and thus improves overall quality of life.

**Keywords:** sleep, insomnia, emotional stress, Heartfulness, Meditation.

## INTRODUCTION

*If you want to develop yourself, adjust your sleep patterns, otherwise you will struggle with this fundamental thing all your life. You will wake up sleepless and frustrated and as a result you will create more and more heaviness within yourself which affects the way you handle the worldly matters - Kamlesh D Patel*

Sleep is as important as food and water. It occupies one third of our lives. Sleep needs vary according to age. Children sleep twelve hours a day and adults need about 8 hours. In the modern world this is simply not feasible. The ever increasing time pressure due to work from employers, educational necessities and domestic

responsibilities have led to a constant decline in sleep hours.

In different studies, approximately 25% of adults mentioned that their sleep was not satisfactory. 10-15% have symptoms of sleep deprivation negatively affecting their day time work. 6-10% met the diagnostic criteria for insomnia. [1]

Short sleep times have become habitual for full time workers as most of them are into long work hours and nightly work schedules. Chronic shortening of sleep time has resulted in circadian rhythm disorders. Sleep problems are also prevalent among children and teenagers due to all time availability of computer games, internet and television. Studies show that this has resulted in obesity, [2] cognitive impairment and emotional disturbances. [3]

In adults, sleep disturbances lead to a wide range of health problems such as diabetes, cardio vascular disease, anxiety, depression, alcoholism and other substance abuse. [4-7]

Chronic sleep restriction among a large number of individuals may eventually impact the society at large in terms of loss in productivity and increased health costs. [8]

Though research has repeatedly highlighted the health risks associated with sleep deprivation and its impact on behavioural patterns, it appears that society has accepted these changes as the norm.

In this article we have reviewed the causes and effects of sleep loss, compare the similarities and differences between sleep and meditation and examine whether meditation can be an option of treatment to address the needs of sleep deprived population.

### **Normal physiology of sleep**

SLEEP-WAKE cycle is regulated by two separate mechanisms.

1. Circadian clock (Process C), also called the Circadian alerting system, situated in hypothalamus, works as a biological clock that controls the timing of sleep, regulates sleep patterns and brain wave activity.

2. Sleep- wake homeostasis (Process S), an internal biochemical system in brain that controls the accumulation of endogenous sleep-inducing chemo transmitters which generates a homeostatic sleep drive.

Both these mechanisms constantly interact and balance each other. They are influenced by genetic factors, ambient temperature, foods, drugs, alarm clocks, meal times, exercise, stress, naps, daily schedules and different mental and physical disease conditions.

Natural sleep cycle goes through 2 phases.

They are Non Rapid Eye Movement (NREM) phase and Rapid Eye Movement (REM) phase. Normally, one starts with a non REM sleep followed by REM sleep and then the cycle starts all over again. Dreams typically occur during the REM sleep.

### **NREM sleep**

There are four phases in Non-REM sleep

**Stage 1** –This is a transition period between wakefulness and sleep, typically lasts for 1 to 10 minutes. Eyes are closed and mind is relaxed in this stage of light sleep. Electro Encephalo Gram (EEG) predominantly shows alpha ( $\alpha$ ) waves followed by theta waves ( $\theta$ ).

**Stage 2** –This is the first stage of real sleep usually lasts about 20 minutes. EEG typically shows sleep spindles and K-complexes.

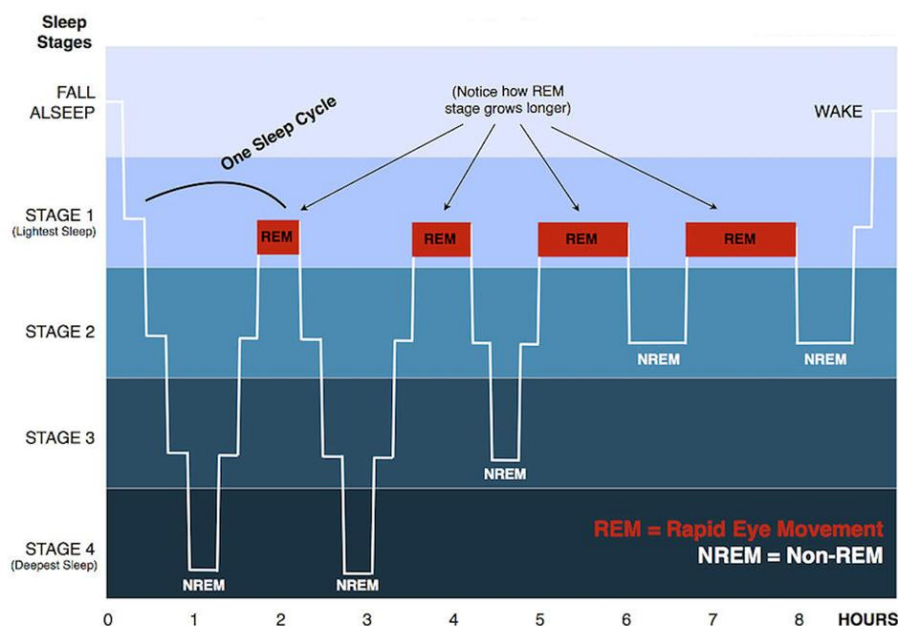
**Stage 3 & 4**–This is a deep sleep usually lasts for 35 to 45 minutes. Body temperature and blood pressure decreases. Muscle tone is decreased but most reflexes are intact. Snoring, bedwetting, sleep-talking and sleep-walking; generally occur in this stage. It is difficult to wake up a person from this stage; if woken up, one generally feels disoriented for a few minutes. Slow delta ( $\delta$ ) waves predominate in EEG in this stage. During this stage, body repairs and rebuilds tissues, bones and muscles and strengthens the immune system.

### **REM sleep**

This stage begins approximately 90 minutes after one falls asleep. The first REM lasts for about 10 minutes and

progressively gets longer in the successive cycles. Brain is active during this stage and rapid eye movements will be present. Active dreaming (dreams are usually remembered) and active body movements are present but it is difficult to wake up the person with sensory stimulations during this phase. Decrease in muscle tone (except respiratory

and eye muscles) is present. There will be irregularity in heart and respiratory rates. Beta waves ( $\beta$ ) predominate in EEG. Waking up in the morning generally coincides with the last REM period. REM stage occupies 50% of total sleep in babies, compared to only 20% in adults. [9-18]



Studies show gender based differences in sleep patterns. Men spend greater time in stage 1 sleep [19] and experience more awakenings. [20] Women stay longer in stage 3 and stage 4 phases and complain of difficulty in falling asleep after mid sleep awakenings. Men are more likely to have day time sleepiness than women. [21] Sleep patterns in women are influenced by menstrual activity, [22, 23] pregnancy and post-partum period. [24-29]

### Sleep Deprivation

Sleep deprivation is commonly referred as inadequate quality and/or quantity of sleep. It may happen consciously owing to the demands in meeting work targets, nature of job, shift duties, mobile or internet addiction and lifestyles like late night social engagements etc. It may also result from primary sleep disorders and different disease conditions that affect sleep.

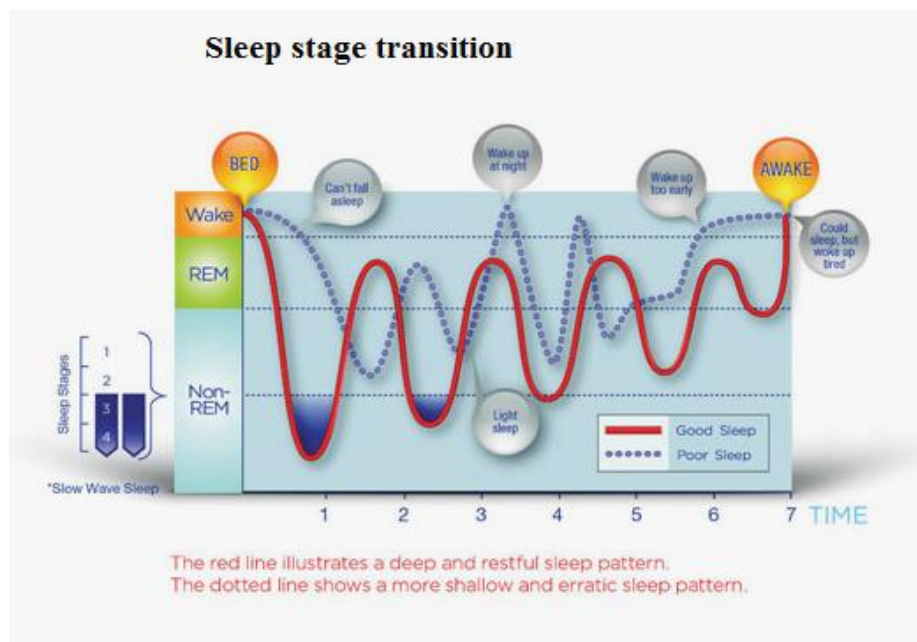
Sleep deprivation may result from shorter duration of sleep as well as from reduced depth of sleep. Repeated interruptions during sleep results in incomplete NREM and or longer REM phases. Poor quality of sleep allows inadequate rest to the body and mind and cause physical fatigue, lack of attention and concentration resulting in increased risk of road traffic accidents and mood swings etc on the successive day. [30] Chronic sleep deprivation results in many physical and mental disorders as explained below.

### Common causes of chronic sleep deprivation

Sleep related breathing disorders (Obstructive sleep apnea, Central sleep apnea, Obesity hypoventilation syndrome etc.), Primary sleep disorders (Sleep talking, Sleep walking etc.), Neurotransmitter imbalances (e.g., Schizophrenia,

Depression, Attention deficit, Anxiety disorders etc.), Concurrent medical conditions (e.g., Connective tissue/Rheumatological diseases, Diabetes, Hypertension, Cardio vascular diseases, Cancer etc.), Commonly used medications (e.g., Alpha blockers, Beta blockers, Corticosteroids, SSRI Antidepressants, ACE

inhibitors etc.), Psychiatric issues (e.g., Stress, Anxiety, Depression etc.) and Environmental factors (e.g., Food, Relationships, Type of job, Sleep Environment etc.) [31] are some of the conditions commonly associated with sleep deprivation



### Adverse effects of sleep deprivation Stress and Anxiety

Anxiety and Sleep deprivation are risk factors to each other.

Population based surveys indicate that the prevalence of anxiety disorder is about 24% to 36% in subjects with insomnia complaints. [32, 33]

Research on the working population of USA and European Union shown that work related pressure is the main source of stress resulting in sleep disturbances. [34]

Stress and anxiety cause sleep deprivation and lack of sleep induces further stress. This precipitates a self perpetuating vicious cycle. [35, 36]

Feeling restless, anxious and overwhelmed is a common symptom of daily stress in developed society. Stress runs in autopilot mode. One assumes it's a way of life. The modern society endorses the demand of a constant 24/7 active lifestyle which is characterized by speed, overload of

stimuli, multitasking and being available all the time. This leads to persistent sleep wake difficulties.

### Depression

Sleep deprivation and depression aggravate each other.

In epidemiological samples examining insomnia and depression, 80% of the depressed persons had at least one insomnia symptom compared with 36% who did not have depression. [37]

In many cases, sleep disturbance is one of the first symptoms of depression. Patients with depression have difficulty in initiating and maintaining sleep. [38, 39]

In patients recovering from depression, if sleep disturbances persist, there was a significant increase in relapse and recurrence of depression. [40, 41]

### Obesity

Obese people are more likely to suffer from sleep disturbances and chronic

sleep deprivation leads to obesity. This bidirectional risk is observed across all age groups. [42-48]

Persons with shorter sleep duration of less than six hours were 7.5 times more likely to have a higher body mass index (BMI) than those who sleep longer. [49] Insomnia was associated with lower levels of leptin (a hormone produced by adipose tissue that suppresses appetite) and higher levels of ghrelin (a peptide that stimulates appetite). [50, 51] This hormonally mediated increase in appetite appears to be the main factor contributing to obesity in patients with insomnia. [52]

### **Diabetes**

As diabetics are known to have frequent sleep disturbances, chronic sleep deprivation is also a risk factor for insulin resistance.

Men with sleep deprivation have an increased risk of age-adjusted Type 2 diabetes. [53] Sleeping pills increase the risk of diabetes. [54]

Research shows that approximately one third of type 2 diabetes patients experience poor sleep compared with healthy individuals. [55] Nocturia and polyuria in these patients are the main causes of disturbed sleep. [56] Obese people with inadequate and fragmented sleep, have high prevalence of insulin resistance. [57]

### **Cardiovascular system**

Chronic sleep deprivation is a risk factor for cardiovascular disease and cardiovascular patients generally suffer from poor quality of sleep.

Sleep deprivation is directly linked to cardiovascular disease - including atherosclerosis, hypertension and risk of coronary artery disease. [58] Rise in blood pressure due to lack of sleep at night persists during the following day. [59] This risk appears to be more in women probably due to their associated higher emotional stress. [60] Acute sleep loss of 3 to 4 hours a night resulted in marked increase in blood pressure in men providing association between sleep deprivation and cardiovascular risk. [61, 62]

There is high prevalence of sleep disturbances among people with cardiovascular disease, adding the risk of hypertension and sudden death during sleep. [63]

Good quality sleep prevents the risk of cardiovascular diseases. [64, 65]

### **Cancer**

Interaction between sleep deprivation and cancer is bidirectional.

In general, the traumatic experience of cancer diagnosis and its treatment causes a negative impact on sleep quality. Along with fatigue, depression and cognitive impairment, sleep disturbance is also an important factor compromising the quality of life in these patients.

19-30% of cancer patients reported sleep problems continuing for several years after diagnosis in different studies. [66, 67]

Insomnia is an important indicator of cancer related fatigue. [68] Sleep disturbances may also result as a side effect from the poly pharmacy of cancer treatment. [69]

Sleep related problems are much distressing and it is not addressed properly in cancer management. [70-72]

Association between sleep deprivations and various cancers such as breast, colorectal, prostate and endometrium were found. [73-77] Individuals getting sleep of less than 6 hours have 50% risk for development of colorectal cancer compared with those who slept for more than 7 hours. [78]

Sleeping for shorter duration in night as a result of evening and full night shifts in individuals shown increased risk of developing prostate cancer compared with non shift individuals. [79-84]

Sleep deprivation associated with working in night shifts results in decrease in melatonin secretion. [85,86] Melatonin depletion has significant association in developing a breast cancer. [87] Studies revealed that development of breast cancer risk is higher in women who are working in evening or full time night shifts. [88, 89]



## **Immune system**

In acute infections, both total sleep time and the duration of slow wave sleep (stage 3 and 4) are increased to facilitate a positive immune response and healing. Disturbances in sleep cycle during this phase can delay recovery and wound healing. [90]

In sleep deprived individuals there is down regulation of T-cell functions and up regulation of pro inflammatory cytokines like IL-1, IL-6, and TNF- $\alpha$ , indicating a response to acute stress and impaired natural immune mechanisms. [91]

Sleep deprivation impairs the development of body's immune response after vaccination. [92] Chronic sleep deprivation results in pro inflammatory state that is the main precursor of most of the lifestyle diseases like obesity, diabetes, arthritis, cardiovascular disease, cancers etc.

In healthy individuals, white blood cell count increases during deep sleep indicating body's readiness to combat infection. [93]

Good sleep is required to conserve body's energy and other resources required to mount an immune response and fight disease. [94]

## **Loss of productivity, early aging and premature death**

Sleep deprivation causes fatigue, mood disturbances, emotional stress and burnout [95-97] eventually resulting in loss of productivity on the long run.

Insufficient sleep negatively affects skin health causing fine lines, uneven pigmentation and impaired skin elasticity leading to premature ageing. [98]

Poor quality of sleep raises the risk of accidents while driving and at workplace. Chronic sleep deprivation is directly linked to the development of anxiety, depression, obesity, hypertension, heart disease, diabetes, cancer etc, also causes impaired immunity and delayed wound healing, ultimately laying a path to premature death. [99, 100]

## **Fundamentals of Heartfulness Meditation**

Heartfulness Meditation is resting the mind on the Heart with one single thought and ignoring all other thoughts - as uninvited guests. Regular practice of this very act trains the mind to pursue only the necessary thoughts and ignore the unwanted ones. This is the true regulation of mind where the mind is guided by the Heart and there is no cluttering of unwanted thoughts in the mind. [101]

Heart is the seat of Intellect and wisdom. Connecting to the depth of heart develops sensitivity, emotional strength and a connection to one's inner self. [102]

The Heartfulness technique for rejuvenation of mind by removing deep impressions through autosuggestion is useful to remove mind clutter. [103]

Burden of emotional stress remains as long as thoughts remain in touch with the physical mind. With this state of mind, one needs longer time to fall asleep and gets, if at all, only a disturbed sleep. Deep meditation on the heart takes the mind into the finer layers of consciousness, physical awareness is lost, and the traffic of unwanted thoughts causing emotional stress is automatically removed. Sleep will be instantaneous, deep and undisturbed for a balanced mind that is trained through regular meditation. [104]

## **Positive effects of Meditation on Sleep Relaxation response**

During sleep, there is reduction in Heart rate, blood pressure, respiratory rate and minute ventilation and there is decreased oxygen consumption and carbon-dioxide elimination leading to a hypo metabolic state with no change in respiratory quotient. [105]

Meditation induces similar physiological changes except that the person remains alert although the physical body goes into a state of deep relaxation. It is a wakeful hypo metabolic state with parasympathetic predominance termed as the Relaxation response. [106]

## **Enhancing Melatonin**

Meditation augments synthesis of melatonin in the pineal gland, a hormone

that regulates natural sleep cycle. [107,108]  
Stress inhibits the production of melatonin. [109]

Risk of breast cancer is linked to the reduction in melatonin levels due to sleep deprivation. [85, 86] Meditation, by enhancing melatonin levels, prevents this risk. [87-89]

Soon after beginning a meditation practice, many people have reported better quality of sleep as well as needing less sleep. [110]

### **Alleviating Anxiety and depression**

Meditation induced regulation of mind directly reduces anxiety and depression. [111-114] This effect is noted in both beginners and advanced meditators. Brainwaves get stimulated in the same way during both meditation and deep sleep, from boosting the Alpha, Theta and Delta waves and reducing the stress associated beta waves. [115]

### **Positive effects on comorbidities that affect sleep**

Meditation has proven benefits in the prevention, treatment and rehabilitation of Hypertension, Ischemic heart disease, Bronchial asthma, COPD, Anxiety neurosis, Depression, Cancer, Certain degenerative diseases and many chronic pain conditions. [116-119] Sleep disturbances are common in these conditions which are also improved by meditation.

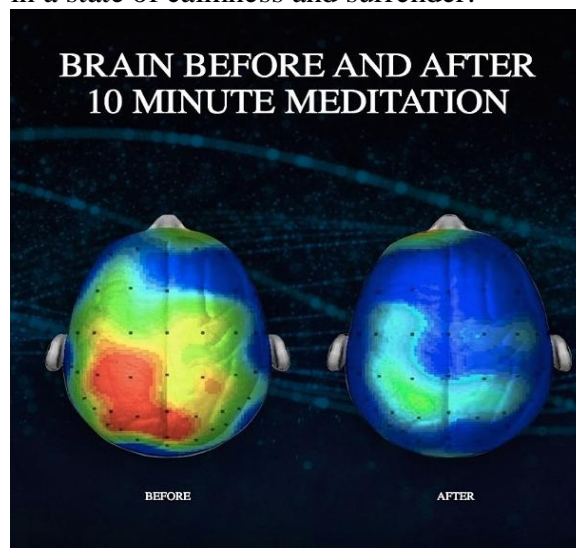
Meditation also influences the cognitive behavioural [120, 121] and emotional aspects [122-125] in these patients, thus improving their overall prognosis.

### **Decluttering the mind and relieving stress**

According to National Science Foundation, our brain produces 50,000 thoughts per day. [126] Ninety-five per cent of these thoughts are repetitive, restrictive, spiral of anxieties and worries about the past and future. Even though the body is at rest the mind cannot unwind itself. This is the fundamental cause of stress leading to sleep disturbances. [127] Training our minds to meditate by ignoring thoughts brings us to the awareness of the present and creates a balanced state within, thereby removes stress. [128] The practice of retaining the

meditative state throughout the day, as we go about with our activity further inhibits the development of stress. [129]

Meditation before sleep hours removes tangled thoughts, prepares the mind to connect deep within and leaves one in a state of calmness and surrender. [130]



Meditative practices thus help to integrate the brain functions, regulate the various physiological mechanisms resulting in a state of mental, emotional and physical well-being. [131]

### **CONCLUSION**

Sleep is a significant component of life that is essential for rejuvenating body and mind on a daily basis. Sleep related problems are growing in the current times due to modern day lifestyles.

Insufficient sleep, both in quality or quantity, causes many adverse effects on the physical and mental health and can lead to premature aging and death.

Meditation shortens time required to fall asleep, enhances the depth of sleep and improves overall quality of sleep.

Positive effects of Meditation on sleep are established by its relaxation response on the body, by decluttering the mind - thereby relieving anxiety, depression and stress and by enhancing melatonin levels. Meditation also improves outcomes of many disease conditions that could

negatively affect sleep and thus relieves sleep deprivation resulting from them.

Method of meditation and systematic practice are crucial to gain the best.

Simplified heart-based raja yoga meditation techniques, like Heartfulness, designed to suit modern day hectic life with their holistic approach, are effective in improving sleep and quality of life, when practiced regularly.

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