

## EFFECT OF AN ELECTRONIC GADGETS APPLICATION ON QUALITY OF SLEEP IN HEALTHY ADULTS

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### ABSTRACT

According to Ayurveda *Nidra* is contemplate as one of the pillar of life (*trayopstambha*). Sleep is a vital part of a healthy lifestyle, but with technological progresses, there are a number of increasing factors that can hinder this vital function, causing poor sleep quality. Various gadgets like cell phones, laptops and desktop computers have become famous across the word. Adults are leading the way in better mobility, selecting laptops to desktops and using their cell phones for a variety of functions, including internet, email, music, games, and video. There have been numerous studies on the factors that can produce sleep problems, with increasing concentration on the association between sleep and electronic media usage in children, adolescents and adults. Deficits in sleep quality and duration have been interrelated to impairments in working memory and concentration as well as problems with memory consolidation, decision making, critical thinking and learning. So, in order to prevent adults from the consequences of poor quality of sleep, this article is focused on amplification of effect of an electronic gadgets application on quality of sleep in healthy adults.

**KEYWORDS:** Electronic Gadgets, Quality of Sleep, *Nidra*.

### INTRODUCTION

According to Ayurveda *Nidra* is contemplate as one of the pillar of life (*trayopstambha*). The three supports of life are intake of food, sleep and observance of *bramhacharya*. Being supported by these three well regulated factors of life, the body is gifted with strength, complexion and growth, and remains up till the full span of life, provided a person does not indulge in such routine as are detrimental to health.<sup>[1]</sup> When mind including sensory and motor organs is tired and disconnected itself from its objects, then individual falls asleep.<sup>[2]</sup> It has been described that *Nidra* (sleep) is *Vaisnavi* (related to *visnu*) it is sinful, and intrudes upon all living beings by nature. When *samdnava* (*srotamsi* channels carrying sensation) become filled with *slesma* (*kapha*) and dominated by *tamo guna* then sleep known as *tamasi nidra* manifests, from which persons cannot be awakened; this occurs at the time of death. Sleep manifest naturally in person with predominance of *tamo guna* both during day and night; in those with predominance of *rajo guna* it occurs without any reason at any time; in a person with predominance of *satvaguna*, it occurs at midnight, this is *Svabhavik nidra* a natural

sleep. In a person in whom *slesma* (*kapha*) has decreased and *anila* (*vata*) has increased, and in those whose mind and body are in trouble by diseases, sleep dose not appears at all, any time; this is *Vaikariki* i.e. abnormal sleep.<sup>[3]</sup>

Electronic devices such as smartphones, laptops, tablets, personal computers, and televisions have become necessary parts of people's lives due to their easy availability and the assistances they offer in smoothing activities of daily living. However, electronic devices can have a detrimental effect on an individual's health, work, or academic performance if not used in controlled manner. Over use of electronic devices has a serious effect on individual physical and psychological health such as headache, visual disturbances, chronic neck and back pain, stress, anxiety, and sleep disruption. Excessive use of electronic devices results into an alteration in sleep architecture, including delayed sleep onset latency and circadian process and decreased rapid eye movement sleep and sleep duration, which are plagued by the brightness of screen display in computer and video games when used just before bedtime. The

bright light exposure from electronic devices at bedtime causes psychophysiological provocations and delays circadian rhythm with other possible neuropsychiatric effects such as depression, anxiety, and night alertness.<sup>[4]</sup>

## DISCUSSION

### Sleep

The vital role of sleep in maintaining health and wellbeing has become increasingly more recognized. Sleep has many functions comprising promotion of growth, learning and cognitive development. Sleep has a role in immunity and studies have reported an association between poor sleep and heart disease in adults.<sup>[5]</sup>

A sleep episode starts with a short period of NREM stage 1 continuing through stage 2, subsequently stages 3 and 4 and finally to REM. However, individuals do not persist in REM sleep the remainder of the night but, somewhat, cycle between stages of NREM and REM all over the night. NREM sleep comprises about 75 to 80 percent of total time expended in sleep, and REM sleep constitutes the residual 20 to 25 percent. The average length of the first NREM-REM sleep cycle is 70 to 100 minutes. The second, and later, cycles are longer lasting which are almost 90 to 120 minutes. In normal adults, as the night progresses, REM sleep increases and is extensive in the last one-third of the sleep episode. As the sleep episode progresses, stage 2 starts to account for the majority of NREM sleep, and stages 3 and 4 may occasionally completely disappear.<sup>[6]</sup>

### Circadian Rhythms

Circadian rhythms are physiologic and behavioral cycles with a frequent periodicity of almost 24 hours. It is created by the endogenous biological pacemaker, called as the suprachiasmatic nucleus (SCN) which is located in the anterior hypothalamus. These rhythms help to control a variety of biological processes, such as sleep-wake cycle, body temperature, feeding, hormone secretion, glucose homeostasis, and cell-cycle regulation. Circadian rhythms are synchronized with the earth's rotation by daily amendments in the timing of the SCN, after the exposure to stimuli that signal the time of day. These stimuli are known as *zeitgebers* (German for "time-givers"), for which light is the furthestmost essential and potent stimulus. The magnitude and direction of the change in phase determined by circadian system the light pulse is presented. A plot of phase alterations according to the time of light stimulus appearance provides a phase response curve. Acquaintance to light results in a phase response curve with delays in the early subjective night (ie, evening) and progresses in the late subjective night (ie, early morning). In addition to light, feeding schedules, activity, and the hormone melatonin can also disturb the circadian timing.

The timing of melatonin secretion by the pineal gland is controlled by the SCN, with the start of secretion

approximately 2 hours before natural sleep time and being highest during the middle of the night.<sup>[7]</sup>

### Chronic sleep Deprivation

Chronic sleep deprivation is connected with raised cortisol and reduced testosterone levels. Testosterone is known to augment the function of the gamma-aminobutyric acid (GABA) and serotonin systems in the brain. This minimize the function of providing one possible causal link between two of the most commonly related psychiatric disorders, depression, and anxiety. Also, raised serum cortisol levels have relationships with depression, anxiety, hypertension, obesity, and diabetes type II. Chronic sleep deprivation associates with augmented inflammatory markers, which is connected with all the above-mentioned comorbid conditions and psychosis.<sup>[8]</sup>

### Benefits of *Nidra*

Happiness, misery, nourishment, emaciation, strength, weakness, virility, sterility, knowledge, ignorance, life and death all these occur depending on the proper or improper sleep. Like the night of destructions, untimely and excessive sleep and prolonged vigil take away both happiness and longevity. The same sleep, if properly enjoyed brings happiness and longevity in human beings.<sup>[2]</sup>

### Causes of loss of Sleep According to Ayurveda

Loss of sleep or Insomnia is caused by aggravation of *anila (vata)* and pitta, exhaustion of mind, loss of tissues and injury to the body; it gets cured by indulgence in opposites.<sup>[8]</sup> Day sleep is definitely abnormal and unrighteousness on the part of the sleeper and aggravated all the *doshas*; from such aggravation, cough, dyspnoea, nasal catarrh, feeling of heaviness of the head, bodyaches, anorexia, fever and weakness of digestive fire develop. Even in those who keep awake at night, the same diseases produced by *vata* and *pitta* may arise.<sup>[10]</sup>

Suppression of sleep due to various regions may cause symptoms like delusion, feeling of heaviness of the head and eyes, lassitude, frequent yawning and squeezing pain all over the body.<sup>[9]</sup>

### Addiction of Electronic gadgets

Sleep is a vital part of a healthy lifestyle, but with technological progresses, there are a number of increasing factors that can hinder this vital function, causing poor sleep quality. Deficits in sleep quality and duration have been associated to impairments in working memory and concentration as well as problems with memory consolidation, decision making, critical thinking and learning.

As the amount of time spent on electronics remain to upsurge, so the effects that it has on our bodies also increased. Various gadgets like cell phones, laptops and desktop computers have become famous across the world.

Adults are leading the way in better mobility, selecting laptops to desktops and using their cell phones for a variety of functions, including internet, email, music, games, and video. There have been numerous studies on the factors that can produce sleep problems, with increasing concentration on the association between sleep and electronic media usage in children, adolescents and adults. Sleep onset-latency (SOL) is the amount of time it takes one to fall asleep after lying down. Several studies have established a relationship between the amount of electronic media usage and the timing of SOL (sleep onset- latency). One of the reasons of delayed Sleep onset latency is nighttime use of EECDS (Electronic Entertainment and Communication Devices). The EECDS emits blue light, which has a direct effect on human sleep as it disturbs the secretion of melatonin, and decreases cognitive performance and alertness. The blue light emitted by EECDS is generally mentioned to as light at night (LAN). Evening light encompassing blue light interrupts the body's circadian rhythm, or internal clock. This meddling interrupts humans sleep wake cycle as well as sleep quality.<sup>[10]</sup>

#### Addiction of Internet

Internet has grown expansively in its accessibility, connectivity and geographic distribution since 1990s and become a part and portion of daily life without being constrained to a specific geography and user group. Internet with its accessibility and ubiquity assimilated with work and private life of people and transformed their life style fundamentally. Use of search engines to look up the information people needed, they communicate with email, download programs and realize their financial transactions online. The internet and its nonstop growing multi-functions link the internet users to the worldwide networks.<sup>[11]</sup> Alimoradi et al. conducted a systematic review and quantitative analysis on the effect of internet overuse on sleep and concluded in the fact that extreme internet handlers had 2.2-fold greater chance to establish sleeping problems and nearly half an hour less sleep compared to regular users.<sup>[12]</sup>

#### CONCLUSION

The Excessive use of electronic gadgets like cell phones, laptops and desktop computers emits blue light, which has a direct effect on human sleep as it disturbs the secretion of melatonin, and decreases cognitive performance and alertness. The bright light exposure from electronic devices at bedtime causes psychophysiological provocations and delays circadian rhythm with other possible neuropsychiatric effects such as depression, anxiety, and night alertness. Thus, electronic gadgets application hampered the quality of sleep of healthy adults. Further, cross-sectional study is need to be done to see the effect of an electronic gadgets application on quality of sleep in healthy adults.

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