

**THE IMPACT OF DIVASWAPNA & AFTERNOON NAP ON
COGNITIVE FUNCTIONS AND WELL BEING – A REVIEW****¹*Dr. Sham Kisanrao Pariskar and ²*Dr. Satish B Patil**

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ABSTRACT

Ayurveda has given elaborate description about the three upstambhas, in order to keep balance of body. The three upstambhas are Ahara, Nidra & Bramhacarya which glorifies Nidra as essential factor for healthy life.^[1] Qualitative & Quantitative sleep that occurs in proper time is appreciated as Bhuthadhatri Nidra it rejuvenates & re- energies body as well as mind. While improper sleep can gives rise to harmful effects on health. As we knows afternoon napping is cross culture phenomenon which occurs across the lifespan. Peoples vary widely in the frequency with which they nap as well as the improvement in the alertness & well being experienced. Napping in the work place is under debate with interesting results on work efficiency & wellbeing of workers. Now a days due to rapid urbanization altered job shift patterns & ignorance of human being they developed tendency to practice sleep in erred way which causes altered sleep patterns up to an extent day to day busy life schedule leads to fatigue & then improper way of practicing Divaswapna leading to manifestation of serious

health issues. Thus an attempt is made to incorporate the radiant knowledge form Ayurvedic literatures, modern text available regarding the benefits of proper day sleep & afternoon naps.

KEYWORDS: Divaswapna, Afternoon nap, Cognitive functions.

INTRODUCTION

In order to maintain good health Ayurveda has given equal importance to Nidra along with Ahara and bramhacarya while describing traya Upstambha, all these three measures should be indulged judiciously to maintain good health. Sleep is the natural state of all living beings which is much essential for maintenance of life.

Sleep is a natural time for the body & mind to rest, reset, detoxify & rejuvenate.

In present era, as a part of urbanization and changes in job patterns, there occurred a drastic or dangerous alteration in the proper sleep during night time. As a compensatory measure people tend to sleep during day time which is beneficial to maintain health & improve work efficiency only if practiced judiciously Acarya's advice day sleep as a device to manage certain clinical conditions too.

Global trends of increased work Domestical & Social demands and associated nocturnal sleep reduction, day time sleepiness have stimulated research interest into counter measures of this day time sleepiness. One counter measure that has received attention in recent years is brief napping. Brief naps have been shown to improve alertness & performance following restricted nocturnal sleep.

Napping in the work place is under consideration with putative benefits on work efficiency & wellbeing of workers.

Even if several countries benefited from the virtues of napping for millenia, rest time at work is still perceived as a waste time, era sign of Laziness^[2,3] in western countries. For example, the right to nap has been enshrined in the Chinese constitution since 1949.^[4,5] In Japan, napping is ideologically accepted in the world of work it is even highly recommended by some companies. It is called "Inemuri" which literally means "to be sleep while present".^[6] Many scientists recommend taking an afternoon nap to increased alertness specially after lunch^[7] to stimulate creativity to strengthen our memory & to improve the performance of complex tasks (executive function).^[8-10]

Research has demonstrated that short nap can benefit cognitive performance the most & the recuperative value of a nap is also dependent on when the nap is taken within the day.^[11-14] Thus, a Systematic review of Diwaswap as told in Ayurvedic literature as well as considering the numerous studies on the effect of napping available, evidence-based data from the

literature done to throw the light on the impact of Divaswapna & afternoon nap, on cognitive function & wellbeing.

Divaswapna (Day sleep)

Divaswapna is a Sanskrit compound consisting of the term Diva and Swapna which means daytime sleep.

According to Ayurveda a healthy individual in order to maintain his health is supposed to wake up during bramhamuhurta.^[15]

This auspicious time comes before sunrise & is fixed during the last quarter of night, from this it can be understood that, the sleep which is practiced after sunrise can be considered as day sleep itself.

Sleep during the night hours is considered as healthy. In contrast to this, Divaswapna (day sleep) is unhealthy but not always. Acarya sushruta clarifies that day sleep is happening due to the predominance of tamadosha. He further notes that altered sleeping pattern is due to predominance of Rajadosha.^[16]

Dalhanacarya confirms it by explaining that due to predominance of Rajadosha, sleep may manifest sometimes during night hours & another time during day hours.^[17] Divaswapna can also be included under Akala Sevana (Untimely practiced) and Ati sevana (excessively practiced) types of Nidra.

Ill effects of injudicious practice of divaswapna on well being

The Harmful effects of Ati sevana of Nidra (Excessively practiced sleep) can be traced out as Ill effects of Divaswapna as well.

As a result of improper digestion there occurs aggravation of Kaphadosha and it fills & obstructs srotases in the body. This gives rise to the manifestation of heaviness of body which results in lassitude. It finally causes excessive sleep and the person may tend to sleep during day time also.^[18]

Divaswapna is contraindicated in all seasons except in summer. But for the individual with aggravated Kapha dosha & medas (Adipose tissue) those who suffer from diseases due to aggravated Kapha Dosha, who consume unctuous food and drinks, and one who suffers from

the ill effects of Dooshivisha (Cumulative toxicity), Diwaswapna (Day sleep) is contraindicated even in summer too.^[19]

As Diwaswapna (Day sleep) is Snigdha (Unctuous), it leads to the manifestation of such diseases due to elevated Kapha and Pitta Doshas.^[20]

It can be understood by considering the clinical conditions born out of untimely sleep which include Moha (Delirium), Jwara (Fever), Staimitya (Timidity), Peenasa (Rhinitis), Shiroruk (Headache), Shopha (Oedema), Hrullasa (Nausea), Srotorodha (Obstruction to bodily channels) and Agnimandya (Reduced appetite).^[21]

Those who practice Diwaswana immediately after taking food will lead to mamsavaha srotodusti.

Table 1: Diseases due to Akaala Nidra according to different Acharyas.

Gurugatrata ArdhavabhedakaJwara

Peenasa Shopha Hrullasa Srotorodha AgnimandyaArochaka

Smriti/Buddhi PramohaIndriya Asamarthya

Acharya Charaka adds Haleemaka (jaundice related), Ardhavabhedaka (a type of headache), skin manifestations (kota, aru, pidaka, kandu), Kaasa (cough), Galaroga (diseases pertaining to neck region), etc. diseases due to improper practice of day sleep.^[22]

Acharya Sushruta hints about aggravation of Tridoshas and adds Shwasa Roga (Dyspnoea) and Arochaka (Anorexia) due to improper day sleep.^[23]

Benefits of diwaswapna

Judicial practice of Diwaswapna (Day sleep) is implemented by considering proper duration and other prerequisites for the same. It is a palliable measure to compensate deprived sleep in the night with aid of day sleep. Acharya Vagbhata says, remaining awake during the night time can be compensated by sleeping during the morning hours for the half the time that had been awake.^[24]

Acharya Vagbhata, Acharya Chakrapaani etc. clearly mention that the compensatory sleep should be done without taking food.^[25]

Acharya Hareetha warns that, sleeping after intake of food even makes the healthy person

sick.^[26]

Acharya Sushruta and Acharya Hemadri suggest that, if a person takes day sleep as such, the duration should be one Muhoortha (40-45 mins approx).^[27] Acc to Acharya Arunadatta, duration of night sleep is 2-3 Yaama (6-9 hrs).^[28]

So the duration of compensatory day sleep can be determined as 3-4.5hrs.

Divaswap is beneficial to those who has got Weakness due to talks, long walks, heavy loads, coitus, alcohol, etc. Pacification of aggravated Doshas Shwasa (Dyspnoea), Hidhma (Hiccup) and Atisaara (Diarrhoea) In order to forget about bouts of ailment Old aged, Child, Debilitated, Urakshata (Injured chest), Trit (Thirst) and Shoola (Colic) For nourishment as well as to forget about bouts of ailment Ajeerna (Indigestion) To attain balance of Doshas Divaswapnochita (One who is accustomed with day sleep To attain balance of Doshas and also to counteract the ill effects due to sudden withdrawal Ratrijagarita (Night vigil) To pacify Vata Dosha.^[29,30]

Divaswapnam and Ritus (Seasons)

During hemantha and shishira ritu avoid divaswapna (Day sleep).^[31]

The classics Ashtanga Sangraha, Caraka Samhitha and Susruta Samhitha opines Divaswapna should be avoided in vasantha ritu. According to Susrutha divaswapnam is also avoided during Pravruta kala. According to Ashtanga Sangraha and Susrutha adviceses to avoid day sleep during varsha ritu. All the Acharyas Caraka,

Susrutha and Vagbatta advice to avoid divaswapnam during sharad ritu.

Contraindications of divaswapnam (Day sleep)

Contraindications of day sleep are except greeshma ritu, other ritus as it will vitiate kapha and pitta in these seasons.^[32] It is contraindicated generally in Medaswi (Obese), Kapha prakriti, Snehnitya, Kaphavyadhi, Dushee visha.

Vyadhis (Diseases) caused by divaswapnam

Diseases caused by divaswapna (Day sleep) are Haleemaka (Advanced stage of jaundice), Shirashoola (Headache), Staimitya (Stiffness), Guru gatrata (heaviness in the body), Angamarda (Body pain), Agni nasha (Loss of digestive power or destroys agni), Pralepo

hridayasya (Feeling as if something is applied around the heart), prameha (Diabetes), sthoulya (Obesity), twak vikaras (Skin diseases),^[33] Shopha (Swelling), Arochaka (Tastelessness), Hrillasa (Excessive salivation), peenasa (Coryza), Ardhavabhedaka (Migraine), Kotha (pruritis), Pidaka (Rashes), kandu (Itching), Tandra (Sleepiness or sluggishness), Kasa (cough), Galamaya (Diseases of throat), khalathiya^[34] Pramoha of smriti and buddhi (Infatuated memory and intelligence), Srotorodha (Obstruction in the channels), Jwara (Fever), Indriyanam asaamarthyam (Inefficiency of the sense organs), Visha vega.

Indications of divaswapnam

Sleeping during day is prohibited in all seasons except summer; greeshma ritu i.e. summer season being the part of adana kala there will be predominance of rookshata (Dryness), vata dosha and nights are short in this season. So, day sleep is advised.

Though day time sleep is prohibited (Generally) sleep of one muhurta during day is not prohibited for Bala (Children), Vriddha (Old aged people), kshata ksheena (Weak due to injury), Madya nitya (One who takes alcoholic drinks daily), Yana (Travelling), vahana (Travelling by vehicle), Adhwakarma parishranta (Who is tired due to hard physical activities, walking or walking long distances), Abhuktavata (Who does not take food on time), Ksheena meda (Who has less fat), Ksheena sweda (Less sweat), Ksheena Kapha (Less kapha), Ksheena rakta (Less blood),

Ksheena rasa (Less rasa), those fatigued from woman (Copulation), the injured, the emaciated; and who are having indigestion. For those who had kept awake at night, sleeping during day for half of that period (Of wakefulness) is desirable.

Those who are habituated to day sleep or keeping awake at night, such sleep and wakefulness do not cause any harm to them.^[35]

Person should avoid sleeping during day and should not keep awake at night. The wise man should indulge in sleep moderately, by doing so, the person will be free from diseases, agni will be good, will have a pleasant mind, endowed with strength, colour, complexion and virility; neither very stout nor very lean,

Afternoon nap

The Afternoon is the part of each day which begins at lunch time and ends at about 6'O Clock.

Nap is sleeping for short period of time (Usually not in the bed).

Thus, sleeping for short period of time during the day i.e. afternoon is called afternoon nap.^[36]

Siesta – A nap in the early afternoon (Especially in hot countries) Afternoon nap is also called as Cat sleep, Cat nap, snooze, forty winks.

Although napping is considered to be a normal daily routine for babies and young children, many people continue to take daytime naps across the lifespan. Moreover, napping is a cross-cultural phenomenon.

A number of factors may influence the degree of benefit achieved from a daytime nap. Homeostatic and circadian processes may interact to determine the extent of restoration, e.g., the quality of the prior sleep period, the duration of the nap, the timing of the nap, and the presence of sleep inertia. Other factors such as subject characteristics (e.g., age, gender, individual differences in napping experience, experience with sleep loss, and degree of sleepiness at the time of testing) or test characteristics (e.g., task sensitivity, task difficulty, timing, or instructions) may also influence the benefits of napping.

Benefits of napping for waking performance have been confirmed by many researchers. For instance, several studies have provided well-documented evidence of the benefits of naps during total sleep deprivation [e.g., Bonnet (1991); OConnor et al. (2004); Song et al. (2002)] and in night shift workers (Purnell et al., 2002; Sallinen et al., 1998). Other studies have documented the benefits of naps during partial sleep deprivation [e.g., Gillberg (1984); Takahashi and Arito (2000)]. Appetitive napping has also been shown to have benefits for non-sleep-deprived groups (Betrus, 1986). These studies have employed a variety of measures to show that napping leads to subjective and behavioral improvements. Napping also improves mood and subjective levels of sleepiness and fatigue. It is particularly beneficial to performance on tasks, such as addition, logical reasoning, reaction time, and symbol recognition.

The main findings were that napping in the afternoon improved cognitive performance, especially for alertness. However, the duration of benefits should warrant further studies, as napping seemed to improve performance within two hours, with conflicting results during the sleep inertia period. An early nap in the afternoon may be beneficial to cognitive performance.

Nap and Cognitive performance

Many people take daytime naps, with the frequency of napping varying considerably depending on the country, from 36% to 80%. Reasons for napping are multiple: in response to sleep loss (i.e., replacement napping), in preparation for sleep loss (i.e., prophylactic napping), or just for enjoyment (i.e., appetitive napping).^[37]

Our review study revealed that napping in the afternoon improved all types of cognitive performance.

Napping is particularly beneficial to performance on tasks, such as addition, logical reasoning, reaction time, and symbol recognition.

Napping appears beneficial for all types of memory, either procedural declarative or short-term memory.

Daytime napping offers various other benefits such as relaxation, reduced fatigue and improve mood. Napping can boost creativity and productivity, improve physical performance, and help people to cope with fatigue related to shift work.

Daytime sleep may also offer cardiovascular benefits in the form of greater cardiovascular recovery from psychological stress. For example, taking a midday nap, occasionally or at least three times per week, was reported to be inversely associated with coronary mortality. This association was particularly evident among working men.^[38]

Naps as a counter-measure to sleepiness

A number of studies have investigated benefits of napping in comparison to other counter-measures of sleepiness such as caffeine and stimulant medication. In 1995 Bonnet et al. (1995) compared the effects of a prophylactic nap with those of caffeine, and found that benefits derived from a nap were less variable and lasted longer than those from caffeine. Bonnet and Arand (1994, 2000) and Reyner and Horne (1997) found that the combined treatment of a nap and caffeine was superior to either alone. Hayashi et al. (2003) compared napping, caffeine, bright light, and face-washing as means to combat mid- afternoon sleepiness. They found that the combined treatment of a nap and caffeine was superior in alleviating subjective sleepiness and aiding performance.

Timing of the Nap and Nap duration

Broughton (1989) summarized that there is well-documented evidence for an increase in sleep tendency in the afternoon, making naps most likely at this time of day. Lavie and Weler (1989) demonstrated that sleep efficiency was better, sleep latency shorter, and amount of SWS greater in a nap taken closer to the afternoon circadian dip in alertness (15:00–17:00 hours) compared with a nap taken during the evening forbidden zone for sleep (19:00–21:00 hours). However, Nai-toh (1981) cautioned that naps taken at the wrong time could lead to prolonged sleep inertia.

In general, based on the research outlined above, healthy young adults should ideally nap for approximately 10 to 20 min [e.g., Hayashi and Hori (1998); Hayashi et al. (1999b); Tietzel and Lack (2002a)]. These short naps are ideal for workplace settings where performance immediately upon awakening is normally required. It seems that naps containing REM sleep may not contribute to alertness *per se*, but may play a role in specific types of memory consolidation gleaned during a nap.

Duration of Benefits and Sleep inertia

The literature reports that the benefits of daytime napping may last 2.5 h, with conflicting results during the sleep inertia period, i.e., after awakening.

The positive effects of the nap were mainly 30–120 min following awakening. For the 30 min after napping, results were mitigated and variable, depending on sensitivity analyses, reflecting putative effects of sleep inertia. Even if we did not find an influence on the duration of the nap, the literature suggests that short naps may benefit more on cognitive performance possibly because napping more than 30 min produces sleep inertia, making nap benefits obvious only after a delay.

Sleep inertia reflects a transition from a sleep state to an awakening state and is characterized by a reduction in the ability to think and perform upon awakening due to sleep. This period is a state of grogginess, confusion and lowered arousal.

The magnitude of sleep inertia is mostly dependent on the quantity of slow-wave sleep contained within the nap. Sleep inertia is greater following longer naps that typically contain more slow-wave activity than shorter naps. So, to avoid sleep inertia, naps should be short (20–30 min), and should not occur at the bottom of the circadian phase. Paradoxically, in

older adults and not in middle-aged workers, napping might both increase morbidity cardiovascular disease, falls and cognitive impairment—and mortality. Daytime napping could also diminish the quality of sleep at night.^[39]

CONCLUSION

Nidra is of prime importance in order to lead a healthy life. Acharya sushruta stated that a person is not supposed to stay vigil in the night nor he should practice day sleep.

An intelligent person who is well aware of the harmful effects the improper sleep methods should practice sleep judiciously.

Proper practicing of day sleep can accomplish both physical and mental health, endowment of strength, complexion, fertility, body fitness, and longevity. Sound sleep in the night can be considered as best for healthy living. In today's world, related with job pattern and all alteration may be required in night sleep. In such cases to compensate Ratri-Jagrana, half the time period of Ratri-Jagrana and Abhuktawat (before meals) Divaswap can be taken and if it is taken after meals it is doshaprakopaka.

Divaswap is abnormal but at the same time it plays important role in maintaining Dhatusamyata of persons to whom it is indicated.

Divaswap is indicated for 48 minutes and Abhuktawat in Divaswap Arhas. Bhuktottar Divaswap is Doshaprakopaka (Rakta, Kapha and pittaprakopaka).

Except Grisma ritu in all other rtu it is contraindicated.

Acarya caraka revealed that night awakening causes rukshata (Dryness) and day sleep causes snigdhata (Kaphadosa vridhhi) in the body, hence one can practice sleep another way i.e. Aasinprachalayitam (Sleeping in sitting position which will not cause any doshaprakopaka).^[40]

Napping in the afternoon improved cognitive performance and especially alertness, until two hours after the nap, with conflicting results during the sleep inertia period. Early nap in the afternoon of 10 -30 minutes was more effective on cognitive performance. However, our analyses included review of almost exclusively laboratory studies. Before recommending daytime napping at work as a preventive strategy, further studies should evaluate the effects of naps on cognitive performance in real work conditions to make the results more

generalizable.

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