A review of Importance of Dhyan (Meditation) and Pranayama in Nidranash (Insomnia)

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Abstract:
Sleep is naturally occurring process of human being which needs no instruction in normal state. Sleep helps in rejuvenation and nourishment of body, after every day’s exhaustion. But civilization has brought many more changes and human has contracted improper methods and attitude of life style which has hampered natural and correct practice of sleep. Dhyan and Pranayama are two procedures out of eight yog stated in Yogdarshana. These procedures have their impact through regulation of prana (respiration) and concentration of mind. Here in this article importance of dhyan and pranayama in the most common sleeping disorder, insomnia according to modern studies, known as Nidranash in Ayurved texts, is discussed.

Keywords: Nidra, Nidranash, sleep disorders, Pranavayu, Dhyan, Pranayama.

Introduction:
According to Ayurveda ahar (diet), nidra (sleep), brahmcharya (celibacy) are three columns of human body. nidra has been stated second after importance of ahar. In Kasyap samhita ‘samyak nidra’ signifies normal state of health. Gaining or losing weight is directly dependent on two principle factors in physiology of living being, namely ‘food’ and ‘sleep’. These two factors are natural necessities of life. Sleep disorders causes disruptions in normal state of physical, mental, emotional, social and spiritual aspect of the health. Definition of qualitative sleep differs according to age, life style, body build etc. Being responsible for physical and mental wellbeing, qualitative sleep brings out the best emotional as well as social performance of an individual. In Ayurveda nidra is stated to be responsible for happiness as well as misery also for strength and weakness etc. This benefit according to Ayurveda indicates physical and mental wellness is dependent on sleep. Changes in sleeping patterns and habits can negatively affect the health. These changes are together known as sleep disorders. The most common sleep disorder experienced by almost every person is insomnia. Insomnia has same characteristics as
Nidranash in Ayurveda. Either occasional trouble sleeping or a sleep disorders can be managed by qualitative sleep, also drugs and medications are available for insomnia. It can be treated up to some extent. Later these drugs develop tolerance and dependency in an individual.

Since the concentration of mind is not easy job; yoga described in ancient sciences offer eight divisions to practice voluntary control over manas (mind). Pranayama is fourth division of yoga science guiding toward voluntary control of respiration. ‘Pranayama’ i.e. proper management of the ‘prana vayu’ is beneficial for control of ‘manas’ which in terms beneficial for active inhibition of some part of brain which may help to get quality sleep. Dhyan is stated as seventh division of ashtangyog which literally means to meditate. Hence helps to concentrate mind and helps to contain aggravated state of man.</p>
kaalswabhawa, aamyaja, chittokhedodbhawa, dehkhedodbhawa, kaphodbhawa, aagantubhawa and tamobhawa are stated in Ashtang sangraha by Acharya Vagbhata. Out of these seven types, first is natural, last is out of sin; rest five types spell out of disease. Three types of sleep are simplified by Acharya Dalhan previously mentioned by Acharya Sushruta. Tamasi, Swabhavik and Vaikarik are those three types according to status of the mind.

- **Importance of Nidra:**
  Qualitative sleep is responsible for happiness, sustenance, strength, potency and intelligence, naturally. In otherwise condition ill practice of sleep causes unhappiness, leanness, weakness, impotency, dullness or insanity.

- **Natural Sleep (Swabhawik Nidra):**
  One of the types stated in Sushrut Samhita, swabhavik nidra can be loosely translated as when sleep occurs naturally. According to Charak samhita, swabhawik nidra influences life and death. Timely sleep offers appropriate weight gain, better complexion, desire to work and fresh and alert status of sensory organs. It also is responsible for balanced status of the body entities.

According to modern science, in studies about passive theory of sleep the view was changed into current beliefs that sleep is caused by an active inhibitory process. Sleep exists in all the mammals and after total deprivation there is usually a period of “catch up” or “rebound” sleep. After selective deprivation of REM or slow-wave sleep, there is also selective rebound of these specific stages of sleep. Even mild sleep restrictions over few days may degrade cognitive or physical performance; overall productivity and health of a person. The essential role of sleep in homeostasis is perhaps most vividly demonstrated by the fact that rat deprived of the sleep for 2-3 weeks may actually die. Despite the obvious importance of the sleep our understanding of the ‘why sleep is an essential part of the life’ is still limited.

Sleep causes two major types of physiologic effects: first effect on the nervous system itself and second effect on other functional system of the body. Prolonged wakefulness is often associated with progressive malfunction of the thought processes and sometimes even causes abnormal behaviour, sluggishness of the thought increases with increased sleep deprivation. In addition, a person can become irritable or even psychotic after forced wakefulness. In brief sleep restores both normal levels of brain activity and normal “balance” among the different functions of CNS in multiple ways. Forceful efforts to avoid sleep or to prevent natural sleep can produce some irritating symptoms such as yawning, body ache, drowsiness, heaviness of head and eyes.

Human sleep and awaken in a fairly constant 24 hours rhythm called a circadian rhythm. Since neuronal fatigue precedes sleep and the sign of fatigue disappears after sleep hence fatigue is apparently one cause of sleep. EEG recording indicates that during wakefulness the cerebral cortex is very active, sending impulses continuously through the body. During sleep, however, fewer impulses are transmitted by the cerebral cortex. The activity of the cerebral cortex is thought to be related to reticular formation.
Stimulation of anterior hypothalamus or the lesion of mammillary body leads to sleep and, the stimulation of mammillary body causes wakefulness. Mammillary body in posterior hypothalamus is considered as the wakefulness centre. During sleep, usually five stages are observed; stages 1,2,3,4 of NREM (non rapid eye movement) or slow wave sleep and REM (rapid eye movement) sleep. In typical 7 or 8 hours of sleep period, a person goes from stage 1 to 4 of NREM sleep. Then the person ascends to stages 2 and 3 and then to REM sleep within 50 to 90 min. In REM sleep, the EEG readings are similar to those of stage 1 of NREM sleep. There are significant physiological differences. During REM sleep, respiration and pulse rate increases and are irregular BP also fluctuates considerably. It is during REM sleep, the person descends again to stage 3 and 4 of NREM. REM and NREM sleep alternate throughout the night with approximately 90 minutes interval between REM periods. In a normal night’s sleep REM totals 90 to 120 minutes.

- Sleep Disorders
  The amount of sleep need depends on several factors, including age, lifestyle, health and whether you have been getting enough sleep recently. On average adults need about 7-8 hours each night. Average hours of sleep required according to age are given as follow\textsuperscript{15}:
  1. Newborn infants : 18-20 hours
  2. Growing children : 12-14 hours
  3. Adults : 7-9 hours
  4. Old persons : 5-7 hours

*Vaikarika nidra*, described by Acharya Sushrut is pathological type of sleep caused by excess decrease in *kapha dosha* and exaggeration of *vata dosha* or existing along with any other physical or psychological disorder. When person is sick, his body and mind are already exhausted and weak with disease. *Kapha* is on lower side and *Vata* is vitiated. In such case mind is extremely weak to response to sensations for sense organs hence it retires and sleep is induced. It’s not natural sleep it is called *vaikariki*. Any disturbance in normal sleep pattern can be a condition of sleep disorders. More than 80 different sleep disorders are stated, out of which some major types include:

- Insomnia - being unable to fall asleep and stay asleep.
- Sleep apnoea - breathing disorder in which breathing for 10 seconds or more.
- Hypersonnia - being unable to stay awake during the day.
- Narcolepsy - extreme daytime sleepiness.
- Circadian rhythm disorders – disturbance in sleep-wake cycle.
- Parasomnia - acting in unusual ways while falling asleep, sleeping, or waking from sleep, such as walking, talking, or eating
- Restless leg syndrome (RLS) - a tingling or prickly sensation in legs, along with a powerful urge to move them\textsuperscript{16}.
- The negative effects of sleep deprivation on alertness and cognitive performance suggest decrease in brain activities and functions. Primarily observed in the thalamus, a subcortical structure involved in alertness, attention and in prefrontal cortex, a region sub serving alertness, attention and higher order cognitive processes. The
study provides evidence that short term sleep deprivation produces global decrease in brain activity with large reduction in activity in distributed corticothalamic network mediating attention and higher order cognitive processes and is complementary to studies demonstrating deactivation of this cortical region during NREM and REM sleep\textsuperscript{17}. There is ample scientific evidence to support the conclusion that sleep is an essential physiological need that must be satisfied to ensure survival. Chronic sleep restriction is frequently experienced due to medical condition, sleep disorders, work demands, social and domestic responsibilities and life style. Partial sleep deprivation can occur in three ways:

1) First involves preventing sleep from being physiologically consolidated and is referred to as sleep fragmentation, which can occur in certain sleep disorders (e.g. untreated obstructive sleep apnoea). During sleep fragmentation, the normal progression and sequencing of sleep stages is typically disrupted to varying degrees, resulting in less time in consolidated physiological sleep, relative to time in bed.

2) The second type of partial sleep deprivation involves loss of specific physiological sleep stages and is, therefore, referred to as selective sleep stage deprivation.

3) The third type of partial sleep deprivation is sleep restriction which is also referred to as sleep debt which is characterized by reduced sleep duration. Restricted sleep time affects many different aspect of working cognitive performance, but especially behavioural alertness.

- **Insomnia (Nidranash)**

The most common sleep disorder experienced by almost every person is insomnia. Insomnia has same characteristics as Nidranash in Ayurveda. Insomnia is characterised by difficulty falling or staying asleep. In Brihatrayi of Ayurveda several references are stated for insomnia in the form of Nidranash and Anidra. In Charak Samhita Nidranash is included under 80 Nanatmaj Vata Vikara. Acharya Sushrut has explained this in Grabh Vyakarana Shariram. In Ashtang Sangraha, Viruddhanna vigyaniya adhyay, Trayopsthambha are explained stating corelation of nidra with vata dosha and hence listing sleep disorder, Aswapna in Vataja Nanatmaj Vikara. Acharya Sushruta has mentioned – aggravated condition of vata and/or pitta, aggravated state of mind, weakness or loss of vital fluid from the body, or due to accidents, hurt or injury- as causes for nidranash.

- **Relation with Vata Dosha and Manas**

The presence of manas (mind) is precondition for knowledge and action. Vata governs manas and all the senses are governed by manas\textsuperscript{18}. Charak describes that manas prompts all types of actions. It restrains and impulse mental activities. It coordinates all sense faculties and helps in the knowledge of their objects\textsuperscript{19}. Different actions of manas, indriya (sense organs) are governed by vayu. Activity of the sense organ is also performed and controlled
by the *vayu*. Brain and in terms central nervous system is responsible for performing all these activities. *Vayu* is controller of the whole body and humours (*doshas*) too. *Hathayog pradipika* has described that *manas* and *maruta* (*vayu*) are conjoined with each other as milk and water. The actions of the both of these are somehow interdependent.

**Vayu and Respiration**

Respiration is most significant process of the body by which CO$_2$ is eliminated from blood and from all the tissues of the body. It replenishes oxygen in the body. The main functions of respiration is –

- Elimination of waste products and drugs such as CO$_2$, ammonia etc.
- Thermoregulation
- Maintenance of all body tissue by regularizing circulation
- Production of speech and other modifications like cry, hiccups etc.
- Resonance of voice

During the procedure of respiration normal air with excess quantity of oxygen also called as “*Pranvayu*” is inhaled and obviously is the most important factor for life. Here *prana* indicates external air. *Vayu* is one of the ‘Tridosha’’s and has been said to have five kinds. *Pranavayu* is one of these kinds that have been recognized as respiration and symbol of life as well as the symbol of soul or consciousness. In common and normal activities of *vayu*, respiration is the most important action. *Hruday* and *mahastrotas* are the sites of original controlling organs of the channels carrying ‘*prana vayu*’ (vital breath). Abnormal respiration like too long, too short, too restricted, aggravated, shallow or frequent respiration associated with sound and pain are the symptoms of the vitiation of *pranvaha strotas*. Besides respiration, *pranvayu* remaining at *murdha* and moving in the area of neck and throat controls *manas* (mind), sense organs and other activities like blood circulation, *kshavathu* (sneezing), *udgaar* (eructation), etc. which are essential for life. In Ayurveda more the attention has been paid toward the physiology of breathing. The physiology explained in ancient *Hindu* texts or *Ayurveda* text almost agrees with modern physiology. According to ‘*Hathayoga*’ which is peculiar science where stress has been laid on the control of *manas* and accepted that *maruta* (air), when controlled provides the control of all physical, mental and vocal activities of the person. In *upanishada* ‘*prana* and *pranavayu*’ are mentioned to control the *manas*. The sense organs are controlled by *manas* and *vayu* empowered to control *manas*.

**Prana and Yoga**

*Yoga* is the ancient system of complete development of human beings has laid too much emphasis on ‘*prana*’. Although the *prana* has different meaning in *ayurvedic* text here it means respiration. According to ‘*Patanjali’s Yoga sutra*’ *pranayama* is one of the eight parts (*ashtangyoga*) viz. *yama*, *niyama*, *aasaan*, *pranayama*, *pratyahaar*, *dharana*, *dhyan* and *Samadhi*. *Pranayama* means control of *prana* i.e. respiration by forcible expelling and by restraining the breath. This *aayam* (exercise) combat distractions and control the sense organs as well as *manas* by regulation of breath thereby
controlling and empowering vayu. Pranayama improves the strength of lungs and regular supply of oxygen to the remote areas of the body. It provides physical, mental and spiritual wellbeing. It is helpful to eradicate the three types of miseries viz. adhidaivik (disease brought about through the influence of evil spirit), adibhautik (diseases caused by and concerned with animals and materials) and ahyatmik (spiritual problems).

Pranayama mainly meant to concentrate the mind on a single pointed object which can be obtained only by proper management of pranvayu. Science of pranayama is a result of deep knowledge on the subject of respiration by ancient Indian scholar. Regular pranayama practices in healthy persons as well as in patients reduce oxygen consumption and provide vital energy. Pranayama provides various techniques for concentration of mind and purification of respiratory tract and by these methods pranvayu can be controlled and hence there by can control manas (mind).

- **Pranayama**
  Pranayama is related to respiratory exercises. ‘Prana’ in the name suggests it’s relation with life force. According to Tejbindupanishad, to get read of all activities of manas (pause in continuous wandering thoughts of mind) is pranayama.

Pranayama has three components:
A. **Purak**: Inhalation of the air into the lungs to its full capacity.
B. **Kumbhak**: Retention of air in the lungs. (Kuhm-BAH-kah)
  Kumbha = pot (a traditional image of human torso as a container for breath with two “openings” at the throat and base of pelvis).
  - **Antara** (ahn-TAH-rah) = interior.
  - **Bahya** (BAH-yah) = outer.

Breath retention: **Kumbhaka**, is the central practice of traditional Hatha pranayama, there are two types of retention: after inhale (antara), and after exhale (bahya).

C. **Rechak**: Releasing the air filled in the lungs.

These three stages, according to Dhyanbindu Upanishad are also known as viz. Brahma (origin), Vishnu (nutrition) and Rudra (destruction).

According to Vaarahopinishad – external environment filled with (bhautik) physical things is Rechak. Knowledge explained in ancient disciplines (Shastra) is Purak, whereas Kumbhak is ‘self-awareness’ (swanubhuti). Pranayama and kumbhak are used as synonym in ancient texts and hence other types of Pranayama viz. 1. Sahit pranayama: kumbhak performed with purak and rechak. 2. Kewal pranayama: kumbhak procedure without purak and rechak. Among these two types of pranayama ‘keval’ type of Pranayama is hard one to practice and succeed which enlightens ‘Kundalini’.

(Kundalini- power associated with the divine feminine, the energy that lies dormant at the base of spine). Hence, pranayama can be described as – to inhale, to retain and to exhale the additional quality of pranvayu or fresh air. As the excess quantity of air is inhaled and restrained for an additional period in lungs, it gets more time to be exchanged by alveoli and the vital capacity of the lungs is increased which is beneficial for health. Pranayama helps
in the process of intake or exchange of oxygen and boosts physical and mental health. Metaphorically, it is stated as ‘pranayama shifts the curtains from light’. Confusions and chaotic thoughts blurring the easy understanding can be cleared out with regular practice of pranayama. Pranayama is the way of meditation to clear all the toxic from body and mind as well as ignites the power of knowledge.

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<tr>
<th>Avar pranayama</th>
<th>Madhyam pranayama</th>
<th>Pravar pranayama</th>
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<tr>
<td>8 sec – Purak</td>
<td>16 sec – purak</td>
<td>32 sec – purak</td>
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<tr>
<td>32 sec – kumbhak</td>
<td>64 sec – kumbhak</td>
<td>128 sec – kumbhak</td>
</tr>
<tr>
<td>16 sec – rechak</td>
<td>32 sec - rechak</td>
<td>64 sec - rechak</td>
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**Time for pranayama**
Normal respiration rate is 12 to 15 per minutes. Aim of pranayama is to decrease this rate and hence number of inspiration and expiration are minimised and deepen breaths. In general purak, kumbhak and rechak should in proportion of 1:4:2 in case of time. Hence Pranayama is classified as avar (inferior), madhyam (medium) and pravar (superior) pranayama.

**Preparation before Pranayama**
According to Hathyogapradiptaikar, pranayama is performed in comfortable posture called meditative posture. Meditative postures stated before as “yogasana” (specific body posture) is a particular set of exercise for body muscles and hence enhances the strength and gives abilities of performing co-ordinated activities steadily without much of exertion. Yogasana is static and dynamic stages in muscle activities. Brahmanandha has specified these comfortable postures by their names for example ‘Swastikasana’; ‘veerasana’; ‘siddhasana’ and ‘padmasana’. Out of these Siddhasana is praised to be best for Pranayama. Along with meditative posture, three types of ‘Bandha’ (Mul, uddiyaaan, Jalandhar); two types of ‘drushti’ (vision) (nasagra and bhumadhya) also called Ghyanmudra is required.

**Nadi vigyan** (science of pulse) is closely related to pranayama. Further modern studies suggest improvement in endocrine, metabolism activities and heart and lung activities.

- **Dhyan (Meditation)**
Concentrating mind on only desired point or thing and hence the person is continuously meditating over only the thing and is not disturbed by any other distraction is called dhyan. Dhyan is explained after dharana (concentration) and before Samadhi (disappearance of all distractions and self-awareness). Dharana stage in Astanga yoga is to increase concentration and come over distractions which provide ground to enter next stage of meditation. Hence Dharana stage is helpful for ‘dhyana’. In Maitreyi and Skand Upanishada – being devoid of all subjects of ‘mann’ (mind) is called meditation.

**Importance of Dhyan (meditation):**
Dhyan (meditation) is persistent or stable concentration. All over the world meditation is practiced in different ways. Some of the procedures are ‘active concentration’ and some are ‘passive manipulation’ dependent. As meditation helps relieve stress and improves patience, it boosts energy for performing daily activities. Transcendental meditation is type of passive process and beneficial to relieve physical as well as mental stress and hence proves to be beneficial alongside treatment for insomnia. Contrary to this Vipashana is active process which enhances physical and mental alertness.

Conclusion
The psychological power in human being proves to have command on human health. This bestowed power of human is very much tempted toward unhealthy practices also. As stated in Ayurveda, Mann despite of being singular, it appears to be plural because of satva, raja and tama reciting unstable to provoke indriyas (senses) to engage in their respective sensory knowledge. Nidra (sleep) stated by ‘acharya charak’ as ‘bhudhatri’ and ‘Vaishnavi nidra’ by ‘Acharya Sushrut’ is when mind gets tired, when sense organs and motor organs get exhausted they no more can perceive their objects and there remains nothing to feed the mind for the sake conveying to soul, in this status, already tired mind does not perceive anything and state of sleep occurs. In Hathyogpradipika specific diet practices are suggested for the Yogi who practices Pranayama and yogasana which helps to master the senses. Regular practice of Pranayama is meant to concentrate your inner energy/power. In sleeping disorder, insomnia regular practice of Pranayama helps in regulation of respiration hence regulating mind to devoid of its agile state and senses to retire from their functions hence promoting sleep. Pranayama is breathing exercise and its systemic and regular exercise improves physiological as well as psychological health. Dhyan helps to concentrate on single point or thing which is contrary to chala guna (moving continuously) of vayu and withdraw sense from their functions and manifest sleep. So in Insomnia Pranayama and Dhyan prove to be effective along with other treatments simultaneously. In general, daily exercise of Pranayama and Dhyan enhance concentration of mind and help to relax stressed mind hence sharpening higher intellectual functions like memory, learning and intelligence.

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