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ASSOCIATION BETWEEN STHOULYA & NIDRA

Ayurveda

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ABSTRACT

Obesity is a medical condition in which a person carries excess weight or body fat, which can have an impact on their health. Sthoulya is described in Ayurveda by various Acharyas as Sthoulya Roga, Medoroga, Santarpana Janya Vyadhi, Dhatvagni Mandhyajanya Vyadhi, and as Atininditiya Purusha. Overweight is defined as a body mass index (BMI) of 25 kg/m2 or higher. Obesity is measured by body mass index (BMI) ≥ 30 kg/m2. In the Asian population, the BMI cut-off of obesity is lower (≥27.5 kg/m2). Anatomically, adipose tissue is unequally distributed in varying proportions in the obese human body. The prevalence of obesity among females is 16.31% and males is 11.56%. This data is acquired from the nationally representative National Family Health Survey 2019–21 1. Acharya Charaka states in Sutrasthana chapter 21st and verse 51 that like a proper diet proper sleep is also essential for the maintenance of the body. Obesity and emaciation (Thin) are specially conditioned by proper or improper sleep and diet. The present literary review is intended to evaluate the relationship between Sthoulya and Nidra using ayurveda and modern scientific principles presented in this verse. Medovaha Strotas Dushti and Diwaswap factors, which are nidan and samprapti elements, are consistently mentioned in various study works. After reading the preceding verse, we should look much beyond diwaswap since late night, brief, prolonged, disturbed, and irregular sleep patterns all have an effect on anna paachan (digestion), dhatu production (metabolism), and, eventually, obesity. In the preceding poetry, Acharya Charaka clearly mentions the association between sleep and weight. Sthaulya (obesity) is an illness that serves as a breeding ground for a variety of risks such as hypertension, diabetes mellitus, and psychological problems. The mortality and morbidity rates are more in obese person. The emphasis on Sthoulya treatment is on pathyapathya, langhan, vyayam, and shodhan treatment, while sleeping practices or patterns are overlooked. Sleep is essential for regulating metabolism and appetite, disrupting it may lead to metabolic disorders such as obesity and diabetes. **Aim And Objective:** To review the roll of disrupted sleep patterns in the management of Sthoulya. Evidence from several research studies indicated that lifestyle components such as sedentary behaviour, physical inactivity and dietary habits are the main factors contributing to obesity among children and adolescents. 2 This article is meant to assess if sleep disturbances should be considered a causative element in lifestyle changes that lead to obesity.[2]

KEYWORDS

Obesity, Sthoulya, Circadian Rhytm, Sleep Disruption, Dincharya, Ratricharya,Rutucharya, Overweight

INTRODUCTION:

The purpose of this article is to shed light on a few sleep disruption conditions other than Diwaswap that precede the Ayurvedic day-night regimen and are accountable for the condition Sthoulya. A number of individuals have already investigated and analysed the underlying cause of various health disorders, particularly sthoulya diwaswapa /daytime-sleeping. The Dinacharya, Ratricharya, Ritucharya, and Sadvritta are components of the correct/ideal Lifestyle measures outlined in Ayurvedic texts for health maintenance and also to obtain a long, healthy active life with relief from pain and disease.

Obesity is regarded as a major public health concern and is recognised as the fifth leading cause of mortality worldwide. Overweight and obesity are two of the most common lifestyle illnesses that cause further health problems and contribute to a variety of chronic diseases such as cancer, diabetes, metabolic syndrome, and cardiovascular disease.

The World Health Organisation has anticipated that by 2030, 30% of deaths will be caused by lifestyle diseases, which can be avoided by identifying and addressing associated risk factors and implementing behavioural involvement programmes. As a result, screening and diagnosing obesity as soon as feasible is critical.

Content:

Like a proper diet proper sleep is also essential for the maintenance of the body. Obesity and emaciation (Thin) are specially conditioned by proper or improper sleep and diet. Charak sutra 21 / 51

The present study is intended to evaluate the relationship between Sthoulya and Nidra using ayurveda and modern scientific principles presented in this verse.

Sthoulya Paribhasha:

मेदोमांसातिवृद्धत्वाच्चलस्फिगुदरस्तनः अयथोपचयोत्साहोनरोऽतिस्थूलउच्यते९|
इति मेदस्विनो दोषा हेतवो रूपमेव च| निर्दिष्टं, ...|१०|

The increase of the Meda & Mamsa Dhatu causes flabbiness and pendulous appearance, thus movement of the abdomen, buttocks and breasts.This improperly formed Medodhatu causes Utsahahani in the individual; such person is called Atisthula.

Obesity is the closest entity used for Sthoulya and Atisthula person is included under Ashta Nindita Purusha.

Sthoulya Vyadhi & Medovaha Strotas:

Meda is one among the Saptdhatu. The internal transport system which is used to carry these Dhatus (Parinampradh) is Srotas. Vitiation and depletion of Srotas can lead to many pathological conditions in body. If Medovaha Srotas is vitiated it will cause Medo Dushti which may be expressed as either Prameha Poorvaroopa or the Sthoulya Vyadhi.

अव्यायामाद्दिवास्वप्नान्मेद्यानां चातिभक्षणात्| मेदोवाहीनि दुष्यन्ति वारुण्याश्चातिसेवनात्| |१६| |
Ch.Vi.5/16
मेदोजौष्ठप्रकोपमधुमेहातिस्थौल्यातिस्वेदप्रभृतयो मेदोदोषजाः||९|| Su.Su.24/9

One of the causative factors is Diwaswap. Diwaswapa /change in sleep pattern develops vitiation in medovaha channels which results into Madhumeha, Sthoulya like diseases.

It is not that inadequate sleep at night alone, but also excessive daytime sleep i.e., DIWASWAPA with exception of Grishma rutu may increase the probability of different metabolic disorders.

Concept Of Trayopstambha (Ch.Su.11/13):

Trayopastambha includes 3 basic tools/pillars of every human being for protection of the life and are Aahara, Nidra & Brahmacharya.

Acharya Charaka has equated human body as building. For making any kind of stable and strong building, the role of pillars and sub-pillars is undisputed.

Similarly with respect to life, Tridanda (Satva, Aatma and Shareera) according to Charaka and Tridosha (Vata, Pitta and Kapha) according to Sushruta act as main pillars and these two are supported by the sub pillars called Trayopastambha.

Hence the sub-pillars (Trayopstambha) Aahara, Nidra and Brahmacharya has been given equal importance as the main pillars (Tridanda and Tridosha) and considered as one of the fundamental factors to stay healthy.

Ratriswabhava Nidra:

रात्रिस्वभावप्रभवा च निद्रा||५८|| रात्रिस्वभावप्रभवा मता या तां भूतधात्रीं प्रवदन्ति तज्ज्ञाः|५९|
देहवृत्तौ यथाऽऽहारस्तथा स्वप्नः सुखो मतः| स्वप्नाहारसमुत्थे च स्थौल्यकार्श्ये विशेषतः||५१|| Ch. Su. 21/51,58

Ratriswabhava prabhava (night originating) nidra is a mother to all the living beings and called as Bhoot-dhatri.

Triggers of Nidra:

According to Acharya Charaka, when the mind is exhausted or inactive, the sense organs are unable to perceive their vishaya, which results in no signal to feed the mind. A person enters Nidra (sleep) in this situation. In Ayurveda the mankind has been instructed to have routine, proper and sound sleep to attain good health and long life.

Catagories of Nidra:

According to Ayurved, Nidra is divided in to 3 categories i.e. Alpanidra, Samyaknidra, and Atinidra. Anidra is having sleep for less than 6 hours, Samyaknidra is sleeping for 7-8 hours and Atinidra is further again divided in 4 parts (Sleep upto 8-10 hours, Sleep upto 10-12 hours, Sleep upto12-14 hours and more than 14 hours per day).

Anidra and Sthoulya:

Perspective of Sthoulya and Anidra is explained in Ashtanindaniya Adhyaya. Acharaya Charaka has affirmed that happiness & sorrow, strength & weakness, virility & impotence as well as survival of life and its termination depend on sleep.[3]

Ayurvedic Approach towards Nidra:

Ayurveda provides a detailed description of personal hygiene, which includes diet and regimen during daily routine (Dinacharya-Ratricharya), seasonal routine (Ritucharya), behavioural rules of good conduct (Sadvritta) and description of suppressible (Dharniya vega) and non-suppressible (Adhamiya vega) urges.

Nidra is specified as a part of Ratricharya (night regimen), and Adharniya vega, and one of the Trayopstambha (basic tools of every human being for protection of the life).

Nidra and Kayagni Relationship:

अर्धं रोग हरी निद्रा | ये स्वपति सुखं रात्रौ तेषां कायाग्निः इच्यते ||
आहारं प्रति गृह्णाति ततः पुष्टिकरं परं | (स्कन्धपुराण)

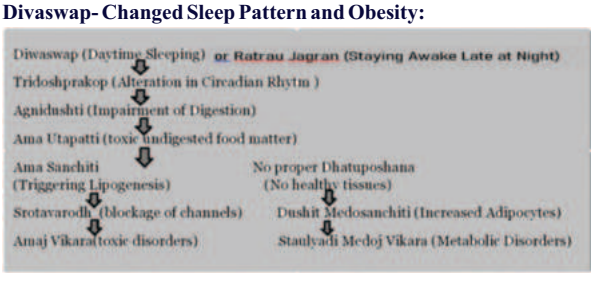
According to Skandhpurana, when one sleeps at night, his or her digestive fire improves. Modern science says daily, good-quality, night sleep on scheduled time maintain optimal metabolism.

Nidra is one of the thirteen types of Vega that are mentioned by different Acharyas which should not be suppressed otherwise person will suffer from diseases like insomnia, mental disorders, digestive disorders and diseases of sense organs.

Role of Agni in Sthoulya:

From an Ayurvedic perspective, food is digested by Bhootagnis that is encouraged by Jatharagni. Dhatvagi further digest and metabolize it and convert into different dhatus. Sthoulya begins due to incorrect food or dietary habits and unhealthy lifestyle including improper sleeping patterns cause trouble with the digestive fire, specially Medo dhatvgni which in turn increases Ama. Ama disturbs metabolic processes to form more fatty tissue and one may develop obesity.

Divaswap- Changed Sleep Pattern and Obesity:



Divaswap commonly disrupts dhoshik balance and circadium rhythm, weakening digestion and producing ama. Ama disrupts the dhatvagni and dhatu creation processes, resulting in the formation of unhealthy dhatus/tissues. Ama also blocks the strotasas of the med dhatu. As a result, med dhatu becomes hipped in the body, resulting in obesity.[4]

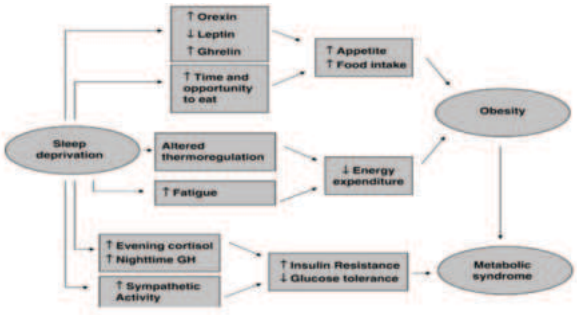
What Modern Science Says about Obesity:

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. A body mass index (BMI) over 25 is considered overweight, and over 30 is obese. The issue has grown to epidemic proportions. Recent studies have reported that globally, more than 1.9 billion adults are overweight and 650 million are obese. Approximately 2.8 million deaths are reported as a result of being overweight or obese. Various studies have shown that the prevalence of obesity among women were significantly higher as compared to men.

Effects of Sound Sleep:

For the safe guard of mental, physical and social health adequate and sound sleep is must. Sleep plays an important role in maintaining the health and helps in repairing of damaged cells. Lack of sleep is one of the common causes in lifestyle diseases. Hence, for prevention of lifestyle disorders TIMELY and ADEQUATE amount of sleep is necessary. Insufficient sleep and circadian misalignment are important metabolic stressors and are associated with weight gain and obesity.

Modern Science View about Sleep Deprivation To Obesity: [5]



Sleep Duration & Obesity Risk: Epidemological Evidence:

Sleep loss has been shown to result in metabolic and endocrine alterations, including decreased glucose tolerance, decreased insulin sensitivity, increased evening concentrations of cortisol, increased levels of ghrelin, decreased levels of leptin, and increased hunger and appetite.

Recent epidemiological and laboratory evidence confirm previous findings an association between sleep loss and increased risk of obesity.[6]

Sleep, Circadian Rhytm Dysynchrony and Obesity:

Sleep is a restorative process of the brain, by the brain, and for the brain. The decrease in sleep duration and increase in sleep complaints in modern society raise concerns for a negative impact of chronic sleep disturbances on mental health and health in general. Behavioral sleep curtailment is becoming endemic in modern times. Ours is a 24-h society with more evening and night-time work and leisure activities, which all lead to a sacrifice of hours available for sleep. This has had a major impact on sleep time, duration of dark exposure, and overall organization of circadian rhythms through the exposure to artificial light after sunset and often before sunrise, resulting in later bedtimes, reduced total sleep time, and the opportunity to be active and ingest food during the natural night.

Feeding represents a major synchronizer of peripheral circadian clocks, which have been found in virtually all tissues. Delayed feeding due to prolonged night-time wakefulness leads to desynchrony between central circadian and peripheral clocks.

Indeed circadian desynchrony as it occurs in shift workers is associated with cardiometabolic alterations and increased risk of metabolic syndrome and cardiovascular disease. On the basis of the link between circa-dian desynchrony and obesity and metabolic disorders, obesity could represent a 'chronobiological disease'.

To date, approximately 50 epidemiological studies done in different

geographical regions have examined the association between sleep and obesity in adults and children. The majority found a significant association between short sleep (generally <6 h per night) and increased obesity risk. A meta-analysis of 18 studies in 604 509 adults demonstrated a pooled obesity odds ratio (OR) of 1.55 (1.43–1.68; $P <$ 0.0001) for less than 5 h of sleep and a dose effect of sleep duration such that for each additional hour of sleep BMI decreased by 0.35 kg/m^2. [7]

Sleeping patterns, light exposure and Metabolism:
Light exposure is closely linked to sleep–wake regulation, activity and eating patterns, body temperature, and energy metabolism.

Following disrupted sleep patterns we get extended exposure to light during dark phase and reduced or dim light exposure during bright phase which alters metabolism. In animals, constant light reduces the amplitude of the circadian rhythm in the SCN, increases food intake, decreases energy expenditure, and increases body weight, along with reducing insulin sensitivity. The extended exposure to light induces arrhythmicity in the circadian rhythm and the peripheral clocks. Similarly, in humans, evening and extended light exposure are both associated with increased body weight, higher BMI, and risk of obesity. Additionally, objective measurement of sleep and light levels using actigraphy showed a positive correlation between mean light exposure timing and BMI. [8]

Thus, by continuously adhering to good sleep habits described by various Acharyas in Ratricharya one can attempt to synchronise the circadian rhythm, hormonal balance, and metabolic activity. This will undoubtedly aid in the weight-loss journey of a patient.

According to modern science, in Circadian Rhythm Sleep Disorder, the circadian clock alters, causing temporal abnormalities in eating patterns and weight gain.

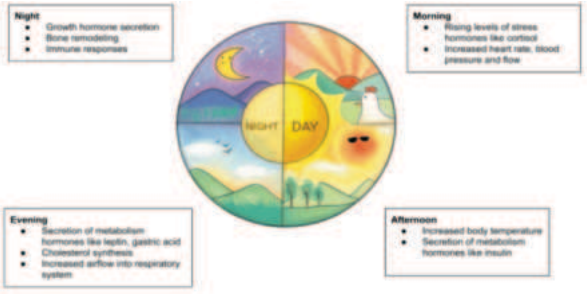
What Are Circadian Rhythms?
Circadian rhythm is the cyclical 24-hour period of human biological activity. The term "circadian" comes from the Latin circa, "around", and Diem or dies, “day", meaning literally "approximately one day".

Circadian rhythms are physical, mental, and behavioural changes that follow 24-hour cycle and are natural mechanisms that responds largely to light and dark. They impact most living things, including animals, plants, and bacteria.

Light is the predominant Zeitgeber signal (time giver) that entrains the biological clock of the SCN. The SCN, in turn, maintains temporal synchrony between internal periodic cycles and the external environment that is thought to enhance overall organismal function and survival**.**

What are Biological Clocks?
Biological clocks are organisms, natural timing devices, regulating the cycle of circadian rhythms. They're composed of specific molecules (proteins) that interact with cells throughout the body. Nearly every tissue and organ contains biological clocks.

Circadian Rhythm & Human Physiology:
View following image to know how daily activities are initiated due to exposure to light and dark and are carried out in a cyclic manner.



Exposure to only natural light, the internal circadian clock synchronizes to solar time such that the beginning of the internal biological night occurs at sunset and the end of the internal biological night occurs before wake time just after sunrise. Modern environment, light exposure is thought to have patterns contribute to late sleep schedules and may disrupt sleep and circadian clocks.

Circadian Clock Changes & Weight Gain:
The circadian clock is a complex and highly specialized network of the human organism and is key for metabolic health.

Circadian rhythms are modulated by behavioural patterns, physical activity, food intake as well as sleep loss and sleep disorders.

Shift work is associated with increased risk for obesity, diabetes and cardio-vascular diseases as a result of unusual eating time and disruption of circadian rhythm.

Leptin and ghrelin are hormones that regulate appetite, and when you aren't getting sufficient sleep, the production of these hormones is altered in a way that creates increased feelings of hunger.

Reduced sleep quality and duration lead to decreased glucose tolerance and insulin sensitivity, thus increasing the risk of developing type 2 diabetes. There are also changes in hormonal and neuronal signalling pathways impinging on human energy metabolism. [9,10]

There are disturbances of the circadian variation in composition of the gut microbiome may be involved in the increased risk of obesity associated with insufficient sleep and circadian misalignment.

Circannual Rhythms:
Circannual rhythms have evolved as genetically programmed adaptive timing mechanisms to allow organisms use favourable seasons to reproduce and grow, and survive through unfavourable seasons. These govern seasonal changes in the physiology and behaviour, and hence optimize offspring survival by coordinating reproductive efforts at the best-suited time of the year, and overall fitness in the periodic world. Studies have stated that the same neuro-endocrine mechanisms are responsible for circadian and circannual (seasonal) rhythms.

Obesity and Circadian rhytm:
Recently, emerging evidence has indicated that the circadian rhythm is important for regulating metabolism because the circadian system modulates energy metabolism and enhances certain energetic activities during day and night.

Lifestyle also has a great impact on the circadian system. In addition to traditional risk factors, sleep and circadian disruptions are known modifiable risk factors for obesity and other metabolic disorders. [11]

Sleep & Circadian Rhythm Disruptions:
When we attempt to stay awake against the schedule dictated by our circadian clock, our mental and physical performance is greatly diminished. Conditions associated with a disruption of circadian rhythms include age, artificial light, environmental factors, physiological factors, jet lag, shift work, mental ailments, pain, medications etc. and other circadian sleep disorders.Those who perform shift work, particularly on night shifts, may experience the effects of a disrupted circadian sleep-wake cycle such as excessive sleepiness, poor sleep, loss of concentration, poor motor control, slowed reflexes, nausea, irritability etc. and many more conditions.

Sunlight, Serotonin And Weight Loss:
Exposure to sunlight increases the brain's release of a hormone called serotonin. Serotonin boosts mood and helps a person feel calm and focused. Serotonin is important for weight loss because it is essentially nature's appetite suppressant. It curbs your appetite, decreases food cravings, and makes you feel satisfied. If your serotonin levels are imbalanced, you may have difficulty controlling what you eat in order to lose weight.

Sunset, Melatonin, Change In Sleep Pattern & Weight Gain:
At night, darkness triggers the brain to secret melatonin. This hormone is responsible for sleep. Melatonin is a hormone secreted by the enigmatic pineal gland in response to darkness, hence the name *hormone of darkness*. Lack of sleep is a known risk factor for metabolic diseases, including obesity, T2DM and heart disease. The link between sleep restriction (SR) and obesity involves the mechanisms of the negative impact of SR on appetite and food intake regulation, altered thermoregulation, increased fatigue, and lower physical activity level. [12]

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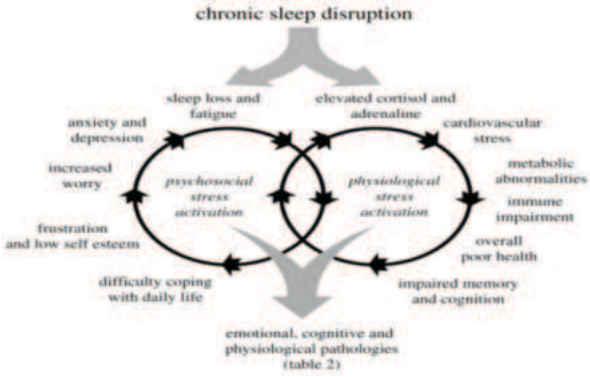

Effects of Sleep Disruption: [13]

Doshas	Chaya (local accumulation) of Dosha	Prakopa (excessive local accumulation)	Prashamana (Auto pacification of Dosha)
Vata Dosha	Greeshma (summer)	Varsha (Raining season)	Sharath (Autumn)
Pitta Dosha	Varsha (Rainy season)	Sharath (Autumn)	Hemantha (early winter)
Kapha Dosha	Shishira (winter)	Vasanta (spring)	Greeshma (summer)

Circadian and Circannual Rhythm In Terms Of Dosha:

A daily routine is essential to maintain health. An appropriate routine helps to establish the necessary structure for Human beings to maintain the equilibrium of Tridoshas. Biological rhythms like Circadian.

The three Doshas- Vata, Pitta, Kapha - which predominantly govern our daily routine life, maintain the integrity of our body and physiological processes by creating, assimilating & diffusing strength. Each Dosha exhibits diurnal variations. It also varies according to digestion phase and age. Age of the individual, Circadian rhythm and food intake are the basic factors that influence the physiology of the human body. Certain Environmental factors and bodily changes cause the Circadian rhythm to be out of sync, leading to many unhealthy conditions and are termed as Circadian rhythm disorder.

A befitting routine has been described elaborately in the classical texts of Ayurveda in the form of Dinacharya, Rutucharya etc, which specifies out a daily, also as seasonal routine, for people to follow in order to enjoy optimal health and harmonious existence. The concepts mentioned in Ayurveda make us understand the best time for daily routines by keeping Doshic rhythms at an optimal level. Understanding the circadian rhythm in Ayurveda, causes for its derangement, its pathogenesis and ways to reset the circadian rhythm as mentioned in Ayurveda is needed to maintain health and to avoid present-day lifestyle disorders.

Beside daily circadian rhythm these doshas also follow circannual rhythm i.e. a particular pattern is followed in relation to different season in a year. These doshas follow yearly cycle by the process of their Sanchaya, Prakopa & Shamana for regulating the biochemical, physiological or behavioural processes of our body. These doshas maintain our physiological process like metabolism, reproduction, sleep according to our internal environment & it is withal influenced by our external environment. *Desh*, *Kala*, *Aahar*, *Vihara*, *Ritu* (seasons) etc affect the equilibrium of these doshas. As a result, the daily and seasonal food and regimen must be in accordance with the body's dosha condition. This maintains the circadian rhythm of the body, sleep cycle and overall health.

Modern science says - within the circadian (24-hour) cycle, a person usually sleeps approximately 8 hours and stays awake for 16 hours. During the wakeful hours, mental and physical functions are most active and tissue cell growth increases. During sleep, voluntary muscle activities nearly disappear and there is a decrease in metabolic rate, respiration, heart rate, body temperature, and blood pressure.

Importance Of Dincharya, Ratricharya & Rutucharya:

All the physiological processes in our body, as well as disease processes, follow rhythmic variations in response to time and environmental factors. In Ayurveda, the cyclical variations are based on the rhythm of Tridoshas, Agni, Sharira Bala etc. with respect to age, time of the day, seasonal changes, food intake etc.

Ayurveda has described Dinacharya, Ratricharya, Ritucharya, Sadvritta, Ahara-Vidhis etc. to balance the rhythmic fluctuations of Doshas in a normal state. Deviation from this normal rhythm leads to various physical & mental illnesses.

Charya consists of two cycles Dincharya and Ratricharya - the Sun & Moon cycles, and it is further divided into 4 hours of Vata, Pitta and Kapha dosha. It channelizes the body clock and makes us self-aware. Some people may develop circadian rhythm disturbances as a result of environmental influences or sleep issues. We can adapt to our body's natural rhythms better by upholding healthy behaviours or by following *Dincharya*, *Ratricharya*.

Ratricharya:
Ratricharya mainly includes Ahara, Maithuna and Nidra, mentioned in Ashtanga Hridaya, AshtangaSangraha and BhavaPrakasha.

Sleep in terms of quality and quantity is essential to maintain an optimum health.

Sleeping at night is conducive to health and thus a sound sleep can prevents many diseases. Sleep is capable of destroying half of our diseases. Skandhapurana says, in a person who is getting good and sound sleep at night has the capacity to digest the food properly, this will enhances the Kaayagni and in turn nourishes the body properly.

Following Dincharya and Ratricharya:
Nature moves in cycles day to night and winter to spring. The movement of Sun is responsible for this diurnal and seasonal variations. Human beings follow these changes by adjusting their routines to keep themselves healthy.

Dinacharya and Ratricharya include all the daily activities starting from waking up at Brahmamuhurtha to sleep, to keep a balance of daily rhythm of Doshas & thereby regularizes a person's biological clock, aids digestion, absorption and assimilation, and generates self-esteem, discipline, peace, happiness, and longevity.

Dinacharya and Ratricharya have been described as the correct sequence of routine one should follow to get a healthy long life and when followed as per the rules leads to balance in tridosha (i.e. vata, pitta, kapha) and in this way directly affect the biological clock & Circadian rhythms of body.

A well-practiced Dinacharya and ratricharya result in good balance which synchronize with Dhatu-Pakka & Dhatu poshan and in formation of Oja which is the main component behind Vyadhikshamatva (immunity) in Ayurved.

Rutucharya:
The seasonal changes affect rhythm of tridosha and get manifested as Sanchaya (Stage of Accumulation), Prakopa (Stage of Aggravation) and Prasama (Stage of suppression of vitiated Doshas). This can lead to an internal imbalance, which in turn leads to various physical and mental disorders.

Ritucharya (seasonal regimen) are various rules regarding diet and lifestyle to acclimatize the changes happening in nature as per different seasons, without altering the body homeostasis.

According to Modern Science as part of our Circadian Rhythm:
Hormones like melatonin and cortisol may raise or decrease. Our bodies produce more melatonin at night and less during the day, which is a hormone that induces sleep & produce more cortisol in the morning, which has the ability to increase alertness.

The master clock then continues to send signals that aid in keeping us sleeping throughout the night & alertness inducing signals throughout the day as a result of light exposure to achieve a balance between our sleep and wakefulness throughout the day and night.

Circadian rhythm also affects our body temperature, eating habbits,

hormonal levels, sleep patterns and metabolism. For example body temperature varies in sleep and awake stages (rises during awake hours and it decreases during sleep).

Metabolism also varies in different phases of the day.

Effect Of Sleep Time, Duration On Metabolism:
Insufficient sleep and circadian misalignment are important metabolic stressors and are associated with weight gain and obesity, are common in modern society.

Insufficient sleep increases energy expenditure by ~100 kcal per day but also increases energy intake by >250kcal per day, resulting in a positive energy balance and weight gain.

Sleep restriction increases the drive to eat, and excess food intake resulting from not sleeping enough is more related to cognitive control and reward mechanisms than to appetite hormones.

Circadian misalignment reduces 24-h energy expenditure by ~3% (~55 kcal per day), alters the levels of appetite hormones and promotes unhealthier food choices than conditions of adequate sleep.

Late night sleeping causes the elevation of cortisol which in turn is responsible for rise in B.P and a risk factor for obesity and diabetes.

DISCUSSION:
- To sustain the circadian rhythm, the following procedures should be taken.
- Seek out sun: Exposure to natural light, especially early in the day, helps reinforce the strongest circadian cue.
- Follow a consistent sleep schedule: Varying your bedtime or morning wake-up time can hinder your body's ability to adjust to a stable circadian rhythm.
- Get regular physical activity during the daytime and avoid exercising close to bedtime, which may make it hard to fall asleep.
- Limit caffeine, alcohol, nicotine, and some medicines, especially close to bedtime.
- Consistent wakeup and sleep schedules, 7 to 8 hours of sleep duration may help to maintain circadian rhythm which ultimately will help to trigger the fat loss.
- Observe following guidelines as quality sleep plays vital role in maintaining health of an individual, helps in prevention of Medovaha strotas dusti/metabolic disorders like Obesity/ Sthoulya.
- Go to bed and wake up at the same time every day. Maintain a 3 to 4 hour gap between dinner and sleep.
- Avoid heavy or large meal within couple of hour before sleep.
- Avoid nicotine and caffeine before bedtime.
- Use the hour before bed for quiet time.
- Avoid use of mobile and other applications before bed.
- Also understand the status and involvement of Dosha.
- Avoid jagarana and diwaswapa, adapt and practice Dincharya, Ratricharya and Rutucharya for perfect Doshik balance.
- To restore health, Dincharya, Ratricharya and Rutuchraya practises should be recommended for patients seeking treatment for weight loss. It will aid in the restoration of expected Doshik Rhythm and the achievement of therapy outcomes.

How Dincharya & Ratricharya Benefits in Sthoulya? –
- Brahma Muhurat Uttishthet –leads to increased digestion and metabolism
- Malotsarga- clears the rectum, increases digestive power, balances kapha
- Tambul sevan - maintains oral hygiene, helps in digestion of food
- Nasya, Dhoompana - stimulates neurological pathway, hypothalamus, helps in regulation of hormone synthesis etc. and regulation of circadian rhythm
- Vyayam- improves circulation and digestion, strength and endurance, helps to relax, induce sound sleep
- Abhyang – strengthens body, improves circulation & sleep pattern, prevents aging
- Snana – improves circulation, promotes longevity and strength, reduces kapha, cleans the sweat
- Sharir Parimarjan – Body cleansing helps to stimulate digestive fire
- Udvartanam –is done before bathing, liquefies the fat, mitigates the kapha
- Anulepan – helps as deodorant in obese patients
- Ahar – Follow principles of Aahar vidhi visheshaayatana
- Dinner – light and in small quantity, taken in early part of night
- Gaman – 100 steps walk before sleep

CONCLUSION:
Evaluate the sleep pattern and duration of any obese or overweight patient that comes to you for weight loss advice.

Also make patient understand the correlation between daytime sleep, insufficient sleep and weight gain. Ask them to continue timely night sleep and discontinue their late-night and daytime sleeping habits.

Follow Nidra Rules (Ratricharya)-
- Sleep between 10 to 11 pm
- Never hold urge to sleep
- Do Padaabhyangam with sesame oil before going to bed.
- Sleep on left lateral position
- Sleep in complete darkness for your circadian rhythm to function well
- Have 7-8 hours of sleep in adults and 10–11 hours of sleep in adolescents
- Follow the aforementioned practises on a daily and consistent basis.

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