



Open  Access Full Text Article

Review Article

Title of Article

A Cross-sectional Study on the Lifestyle vis-à-vis Lifestyle Disorders in Young Adults with reference to the Sleep Pattern

¹Dr. Raviraj Alopiprasad Pardeshi, ²Dr. Prasad Deshpande, ³Dr. Gaurishankar Urkude

¹Professor Dept Of Kriya Sharir, Indutai Gaikwad Patil Ayurveda Colloge and Reasearch Center, Dhuti, Nagpur
²Asso. Professor Dept Of Swasthavrutta, Govt. Ayurveda Colloge Nanded. ³Asso. Professor Dept Of Swasthavrutta, Shri K. R. Pandav Ayurveda Colloge Nagpur.

Article Info:

Article History:

Received: 18 Aug 2023

Accepted: 12 Feb 2024

Published: 5 May 2024

Address for Correspondence:

Dr. Raviraj Alopiprasad Pardeshi,
Professor, Dept Of Kriya Sharir, Indutai
Gaikwad Patil Ayurveda Colloge and
Reasearch Center, Dhuti, Nagpur
Email- raviraj.pardeshi@gmail.com

ISSN No.: 2583-5971

ABSTRACT

Modern lifestyle and sleep patterns have drastically changed because of the so-called sociocultural and technological advancement. A structured validated questionnaire was provided to the participants. The questions incorporated the concept of healthy sleeping pattern, status of agni and ahara. In this cross sectional study, it was found that there is a very low prevalence of lifestyle disorders in those who adhere to good sleeping practices. Bowel habits and appetite are also found to be influenced by the quality of sleep. The observations indicate that the population compliant to the principles of Ayurveda and adhering to traditional lifestyle is already aware of the risk and hence is following good sleeping practices. This positive quest for a wellness should be adopted by all so that everyone is benefited in future. A structured validated questionnaire comprising 15 multiple choice questions was provided through google form to the respondents of either genders above the age of 30 years and who consented to participate. The questions incorporated the concept of healthy sleeping pattern, status of agni and ahara in the language best understood by the respondents. This observational, cross-sectional study was conducted during 2021-22. It was planned to study the association between the time of waking up in the morning and health profile of an individual. This association was studied in an individual to look at certain components like the bowel habits, appetite (agni), blood pressure, diabetes mellitus, heart disease (ischemic), and overall strength. Detailed information was sought from the participants. Over 307 participants participated in the study.

Key words- Sleep, lifestyle, brahma muhūrta, agni and ahara.

INTRODUCTION

Āyurveda is a holistic science. Adherence to prescriptions of wholesome and healthy lifestyle and compliance to the protocol mentioned in classics guarantees the health for individual and community to the maximum possible extent. Knowledge related to age and measures of longevity have been discussed in detail in various Ayurvedic scriptures thousands of years ago with the primary objective to protect, sustain and preserve health; by improving the quality of life and providing solutions for various disorders. The same has been explained by Ācārya Suśruta (Su. Sū. 1/14). Apart from this, measures of longevity have also been discussed in detail in this and other scripture thousands of years ago with the primary objective to protect health. Ācārya Caraka in Carakasamhitā speaks about three supporting pillars of life (Ca. Sū.11/3), which are- āhāra, nidrā and observance of brahmacharya (celibacy or control of senses). If one possesses knowledge of this and knows how to get support of these three pillars, one can get a body with vigor, excellent complexion and suitable development and this continues all the way through life, provided, an individual does not engage himself in regimens that are unfavorable for health.

Brahma Muhūrta and Circadian Rhythm - 'A person with discipline and self-control must all the time feed his agni with the fuel of healthy food and drink and stay alert and mindful of the consideration of measure and time. (1 Suśrūtasamhitā Sutrasthāna 2 Carakasamhitā Sutrasthāna) An individual whose agni is in good state, who feeds it

duly with a healthy and nourishing diet, who performs daily meditation, charity and is on the path of attaining spiritual salvation, and who consumes food and drinks that are healthy and harmless to him, will not become victim of diseases and fall ill except for very special reasons. The disciplined man, who adheres to the practices of consuming wholesome diet lives for a period of 36000 nights, which is equal to hundred years. Such an individual is blessed by good people and is free from disease.' (Ca. Sū. 27/345-348).

The detailed description about daily routine right from waking up in the morning to before going to sleep at night is found in the Ayurvedic classics. In order to lead a healthy life, the first rule mentioned in the text Aṣṭāṅga hṛdaya, Ācārya Vāgbhaṭṭa instructs to wake up on brahma muhūrta in the morning. Ācārya Aruṇadatta, while fixing the timing of brahma muhūrta explains, that the night consists of 15 muhūrta, in which 1 muhūrta is considered to be of 46 minutes. Out of these 15 muhūrtas, 14th muhūrta is considered as brahma muhūrta. That is, the period starting from about 96 minutes before the sunrise. This means that it is a total period of 2 muhūrta (before sunrise) which comprises brahma muhūrta (Aṣ. Hṛ. Su.1/1) The rhythmic relationship between the day-nights and season has been clearly explained in the classics. Ācārya Suśruta has divided this into 6 parts. These 6 parts are compared with 6 ṛtus or seasons. The division and comparison is done as given below: (3 Carakasamhitā Sutrasthāna, 4 Aṣṭāṅga hṛdaya Sutrasthāna)

Time slot	Dominancy of doṣa	Period	Ṛtu
Purvānha	Kapha	~6-10 AM	vasanta (spring)
Madhyānha	Pitta	~10 AM – 02 PM	grīṣma (summer)
Aparānha	Vāta	~02 AM – 06 PM	prāṇṣṭ
pradoṣa	Kapha	~06 - 10 PM	varṣā (rainy)
Madhyarātri	Pitta	~10 PM – 02 AM	śarada (autumn)
pratyūṣa	Vāta	~02 AM – 06 AM	hemanta (winter)

Table 1. Rhythmic relationship between the day-nights and season and doṣic predominance as described in Ṛtucaryādhyaḃyaḃ (Su. Sū. 6/14).

The rules of hygiene and the prophylactic measures have also been discussed in detail in Ayurvedic classics, specifically in anāgatabādhāpratiṣedhaḃ adhyaḃya in Suśruta Samhita. There is description of the rules and code of conduct to be daily observed daily and practiced regularly by an intelligent man after waking up. This is described for an individual who is desirous of having a sound body and perfect health. 'Scientific research has determined that in Brahma Muhūrta, the oxygen level in the atmosphere is almost 41%, which is beneficial to the lungs and brain, as higher oxygen levels keep the brain

active for a longer time (Narayanan, 2020)'. This has many benefits including boosting the immune system, increasing energy levels, maintaining pH balance and relief from stress, aches, pains and cramps. A study, which was done on 840,000 individuals, by researchers at the University of Colorado Boulder; MIT and Harvard's Broad Institute provides (Iyas Daghlas, Jacqueline Lane, Richa Saxena, 2021) some of the strongest evidence yet that chronology of an individual's tendency to sleep at a certain time affects risk associated with the depression. It is also one of the most important studies to measure the extent of change needed to affect mental health. As it has been witnessed recently, as people come out, in the aftermath of the Covid-19 pandemic, to work and attend

schools remotely, the habit that has pushed many to adopting to choose a later bedtime schedule. If studied carefully, these findings could have significant implications.

Timing of waking up - Āyurveda describes the way of living, in which the rules necessary to lead a healthy life are described. A study of 840,000 people by researchers at the University of Colorado Boulder and MIT and Harvard's Broad Institute provides some of the strongest evidence yet that chronologically a person's tendency to sleep at a certain time affects risk of developing depression (Iyas Daghlas, 2021). It is also one of the first studies to measure how much, or how little, change is needed to affect mental health. As people emerge, in the aftermath⁽⁵⁾ *Suśrutasaṃhitā Sutrasthāna*) of the pandemic, to work and school remotely, a trend that has pushed many people to a later bedtime schedule. These findings could have important implications.

A long biological clock or circadian rhythm is any biological process that is endogenous and has smooth oscillations of about 24 hours. Some external factors like light mostly affect the circadian rhythm in humans. A turbulent lifestyle also affects this clock. As a result of this many undesirable symptoms and diseases develop. This time of morning is very useful for performing meditation and yoga. The person who does this regularly, his *smṛti* becomes sharpened and he moves towards the ultimate goal of yoga, the salvation. If we become habitual of waking up at brahma muhūrta, this regulated and pacifies *vāta* (*doṣa*) which definitely controls the mind also. Therefore, complying with this habit is necessary for spiritual development. A person who wakes up early in the morning, his/ her aging is delayed. According to *loka puruṣa sāmya siddhānta* this is the right time to align oneself with the cosmic power equilibrium principle.

The current era, where the majority of the working professionals have to engage themselves in multitasking. While doing this they often ignore the rules and this causes disturbances in overall health. The occurrence of delayed sleep-wake phase disorder is more among adolescents and young adults. It is found that this rates ranging between 3.3 and 4.6 percent (Sivertsen B. et al, 2021). The prevalence of delayed sleep-wake phase disorder in adults is low, estimated to be between 0.2 and 1.7 percent (Ohayon MM et al, 2000). Even though the incidence of familial delayed sleep-wake phase disorder has not been recognized, a family history is often found there in affected individuals (Nesbitt, 2018). Men and

women are affected equally. A delayed sleep-wake cycle causes a lot of physiological and psychological problems in an individual. Looking at this, it becomes relevant to recognize the importance of rising at brahma muhūrta. Melatonin is a secretion of the pineal gland in the brain that peaks in the midnight and decreases towards dawn, i.e. during brahma muhūrta. It is a hormone that induces sleep. Melatonin is touted medically as a mood stabilizer. The decline in melatonin is accompanied by the secretion of cortisol, an antistress and anti-inflammatory hormone whose levels are highest in the morning. During brahma muhūrta, i.e. 'Creator's Time', high levels of cortisol keep the mind calm and calm (Narayanan, A., 2020).

Duration of Sleep

The duration of sleep varies widely across the lifespan and different stages of life, and shows an inverse relationship with age, i.e. as we age, the sleep (quality and quantity reduces). Also, the ideal quantity of sleep necessary each night can vary among people due to genetic factors and some other factors. (Chaput, J. P. et al., 2018). Periods of sleep and wakefulness alternate about once a day; that is, they manifest a circadian rhythm consisting on average of 8 h sleep and 16 h awake (Eric P. Widmaier, Hershel Raff, and Kevin T. Strang, 2008). Getting awake early in the morning is considered beneficial for health. Ayurvedic classics advise that one should wake up at brahma-muhurta. However, this early awakening must be distinguished from advanced sleep-wake phase syndrome in which people feel sleepy in the late afternoon (6 p.m. and 9 p.m.). Also, they get up early (e.g. between 2 a.m. and 5 a.m. Even as the timing of sleep is in the early hours, sleep itself is mostly usual and normal. Advanced sleep-wake phase syndrome is different than this. It moves sleep onset to the early evening hours and there is early morning awakening. (Harrison's, 2016).

Duration of Pattern of sleep

Sleep restriction has considerable negative effects on sleepiness, motor and cognitive performance and mood. It also affects negatively some of the hormonal, metabolic, and immunological variables. This has been demonstrated by the study on the effects of both acute and cumulative partial sleep deprivation (Ferrara and De Gennaro, 2001). It is observed in day to day life that vigilant attention and cognitive performance starts declining after 16 hours (or more) of persistent wakefulness. If the sleep consolidated and not fragmented, it is much restorative and more beneficial of waking functions, health and overall wellbeing. This sleep is consolidated sleep as it is typically of a longer duration and is having better sleep

quality as compare to the sleep taken during other times of the day. This is observed in people engaged in night shift working, jet lag, and other conditions of circadian misalignment (Worley, 2018). Sleep is a essential and fundamental need of a nervous system which in itself is complex one. The experiments on sleep deprivation in humans and other animals have shown that it is a homeostatic requirement, as there is a need for food and water. (Eric P. Widmaier, Hershel Raff, and Kevin T. Strang, 2008)

Quality of sleep - It is assumed that individuals have obtained the right quantity of sleep if they wake up feeling well, having complete rest and perform their activities fairly well during the whole day. Other important sleep characteristics, such as sleep quality and sleep timing should be considered beyond sleep quantity (Chaput, J. P. et al., 2018). Underexposure to daylight (sunlight) and exposure to excessive nighttime light can lead to disturbance in the circadian rhythms (Medic, G. et al, 2017). Sleep deprivation and insufficient sleep is associated with compromised immune function. It has been observed that loss of a single night's sleep can reduce the potential activity of blood's natural killer cells. These lymphocytes play an important role in the defense mechanism of the body (immunity). (Eric P. Widmaier, Hershel Raff and Kevin T. Strang, 2008)

Bowel habits, appetite, frequency of meals and sleeping pattern - Bowel habits (purīṣapravṛtti). As per Amarakośa the saṃskṛta word 'purīṣa' is derived from the root "pṛ" by adding the suffix "iṣana", which means to fill with pieces or loose soil, excreta, waste, solid mass (intestines) etc. It is referred to in saṃskṛta literature as śakṛta, varca. From the stomach (āmāśaya) the food particles reach the large intestine and by absorbing the uṣṇa guṇa of the pitta and the rukṣaguṇa of the vāta, the lumps are formed (Ca. Ci. 5/11). Defecation is regulated by apānavāyu. The purīṣa is a basic component of the body. It supports the functions of vāyu and agni in the body. (Ca. Ci. 15/5 and As. Hr. Su. 19/4). Purīṣa is vitiated due to atyaśana (overeating), adhyaśana (eating during dyspepsia), especially in malnourished and debilitated persons, due to blockage of the excretory ducts (Ca. Vi. 5/21). There is an impact of circadian rhythm on sleep and it is observed that the bowel habits are affected by the sleep. The circadian rhythms function to harmonize and synchronize the sleep with the external day-night cycle. This, it does via the suprachiasmatic nucleus (SCN) which receives direct signaling input from neurons in the retina functioning as detectors of the brightness (Medic, G. et al, 2017). Negative effects on the

sleep quality of healthy individuals have some correlation with the food intake during the nights. It has been found that food consumed before or just before the ⁶ Carakasamhitā Cikitsāsthāna. ⁷ Carakasamhitā Cikitsāsthāna and Aṣṭāṅgasaṃgraha Sutrasthāna ⁸ Caraka samhitā Vimānasthāna) sleeping period i.e. dinner and late night snack; was associated negatively with sleep quality (Crispim, C. A. et al, 2011). It has been demonstrated that food intake at some time point in the night is correlated with negative effects on the quality of sleep on healthy individuals also. Certainly, food intake near the sleeping period was found associated negatively with sleep quality variables. However, more studies are essential to elucidate the real consequence of food eating on sleep (Crispim C.A. et al, 2011)

Yoga/ pranayama exercise and sleep - To study the effect of yoga on sleep, meta-analysis and systemic review of the large number of RCTs was done. These trials were having females as participants. The analysis (Wang, W. L. and others, 2020) proved that yoga based intervention in female population has benefits when compared to non-active control conditions in terms of managing troubles associated with the sleep. Physical exercise improves digestion and metabolism. Therefore to maintain balance and health, one should exercise according to the position of fire. Physical exercise should be done almost every day. It makes the body fleshy and physically powerful, helps in gaining the proportioned development and growth of the muscles, improves the complexion and overall appearance. It also ignites the digestive fire and improves the digestive function, reduces and removes laziness and makes the physical body light, sleek, firm and compact. The person doing exercise regularly does not fall ill easily and diseases fly away from him. It is always good to be habituated to physical exercise. One who does some form of exercise regularly looks young and handsome, even if he is older or aged. Regular physical exercise makes person capable of digesting even a food consisting of articles incompatible in their potency and undigested and decomposed food. However, Āyurveda does not advise to perform exercise with the full capacity and using a full strength. It is considered as harmful. Āyurveda gives a prescription to a man seeking his own good asking him to perform physical exercise only to the half extent of his capacity (balārdha) every day. The amount of exercise which makes the person (take) breath from mouth (i.e. some degree of difficulty in breathing) is 'balārdha' exercise. Individual's physique, strength and food as well as the season of the year and the physical nature of the locality environment/ atmosphere) are some of the

factors one should consider before one starts physical exercise. If the amount of exercise is just adequate, one can have a sound sleep and sound sleep, in turn brings energy and enthusiasm to perform exercise.

Diabetes mellitus, ischemic heart disease, hypertension and sleep -

Diabetes mellitus (DM) is classified as a syndrome. It contributes to impaired carbohydrate, protein and fat metabolism, which is caused by either deficiency or lack of insulin secretion or decreased sensitivity of the tissues to insulin (Guyton and Hall, 2006). Blood glucose has to be within the physiological range. It is not well controlled over a period of time, it affects the functioning of blood vessels supplying to the organs including brain and heart. Long term abnormality can lead to structural changes in the organs compromising their overall functioning. This may cause the increased risk for heart attack (myocardial infarction), paralysis or neurological deficit (stroke), end-stage renal disease, poor blood supply to retina causing retinopathy, and ischemia of the limbs. In the Alameda County Study, Wingard and Berkman have studied the mortality risk and its association with different sleeping patterns. These findings were based on data from 9-year mortality follow-up wherein there were 6928 adults, as participants. It was found that the mortality rates from IHD (ischemic heart disease), cancer, cerebrovascular episodes, and all causes combined were lowest for individuals who were habitual of sleeping 7 or 8 hr per night (Michiaki and Satoshi, 2010). In recent time also, the studies have shown that there is association between increased home-measured blood pressure (BP) variability and short and long sleep durations and insomnia. The increase in the blood pressure is because of increase in the peripheral resistance and increased arterial stiffness (Nagai, M. et al, 2013). It also has been studied that increase in cortisol levels, compromised immunity, and elevated markers of sympathetic activity in sleep-deprived subjects (mostly healthy) and those having difficulty in sleeping i.e. chronic insomnia (Khan and Aouad, June 2017).

If we see this from the perspective of Āyurveda, the physiological aspects of blood pressure is basically based on the tridosha theory (Patwardhan, 2012). Vyanavayu continuously draws blood from the heart and it further distributes it throughout the body. It can be assumed that the systolic blood pressure generated during heart contraction is regulated and controlled by vyānavāyu. SA node generates spontaneous impulses. The firing of these impulses is controlled by sympathetic and parasympathetic nerve fibers (autonomic nervous system). The location of prāṇavāyu is śira (brain) (Aṣ. Su.

12/4). This prāṇavāyu controls the heart (hṛdaya). It means that the motion of the heart is controlled by prāṇa. From this, it can be learnt that vyānavāyu and prāṇavāyu both represent the nervous control of blood circulation. The vāta mostly represents the nervous system. (Tripathi P. et al, 2011).

Sleep and perceived obesity - Āhāra (food) and nidrā (sleep) are determinants of sthaulya (obesity) and kārśya (lean-thin) (Ca. Su. 21/51). Waking up at night increases raukṣya (dryness) in the body resulting in vitiation of vāta, while sleeping during the day causes snigdhatā and kaphapittavitiation (Ca. Su. 21/50). Sleeping in the afternoon in a sitting position does not affect doṣa balance. When a healthy person spends a lot of time sleeping during the day, it provokes the three doṣa (vāta, pitta and kapha). Doṣa can cause many ailments like cough, shortness of breath, rhinitis, heaviness of the head, body pain, anorexia, fever, impaired digestion (Su. Su. 4/38). Neuronal and endocrinal function is modulated by sleep also significantly. The same is true with glucose metabolism. Sleep loss or sleep of a poor quality may lead to metabolic and endocrine alterations, including reduced insulin sensitivity, impaired glucose tolerance, and increased appetite and hunger. As glucose is not readily available for the cells, there is increased perception of hunger. These factors appear to play an important role in causing obesity also. Epidemiological and laboratory studies in recent times have confirmed earlier findings of an association between the loss of sleep and increased risk of obesity (Guglielmo and Silvana, 2011).

Sleep and stamina/ energy

The word 'nidrā' means sleep. It is a natural physiological process that occurs in all living things, usually at night. After a long day of hard work, the body and mind need rest. As we develop fatigue, the energy goes down and we lose the stamina to continue working, both ⁹ Aṣṭāṅga Hṛdaya Sutrasthāna, ¹⁰ Caraka Saṁhitā Sutrasthāna, ¹¹ Caraka Saṁhitā Sutrasthāna, ¹² Suśruta Saṁhitā Sutrasthāna) physically and mentally. Fatigue is experienced as one of the many symptoms by patients whose sleep is poor or those who are sleep deprived. Fatigue can be judged as a nonspecific sense of a relatively or absolute low energy level. There is also the feeling of exhaustion even after little exertion. Nidrā (sleep) is as essential as food (diet) and brahmacharya (path to ultimate truth). These three are the three pillars of life (Ca. Su. 11/35). The desire to sleep is one of the natural urges (adhāraṇiya vega) that cannot be suppressed (Ca. Su. 7/3). Sleep is a function of the mind. All forms of perception or connection with the external world are

blocked in sleep. During sleep the mind is separated from all sense organs and motor organs (Pātanjali Yogasūtra 1/20). Normal sleep is responsible for happiness, nourishment, vigor, virility, knowledge and vitality. Conversely, abnormal sleep can lead to suffering, malnutrition, weakness, impotence, ignorance and death. Untimely sleep, excess and deprivation can take away the good fortune of life. Proper sleep can bring happiness. (Ca. Su. 21/36-38) . Those who practice right sleep are free from diseases, have pleasant dispositions and are endowed with strength, character and virility. Right Sleep maintains shape of body. (Su. Su. 4/39-40) .

Need of a wellness clinics and programs - In the report published as a result of WHO technical meeting on sleep and health (22-24 January 2004) it is found that sleep is an important part of lifestyle. It is estimated that an average person spends about 1/3rd of his life sleeping. It is true that the sleep is a basic human need and is essential for sound physical and mental health. It is also essential for one to feel good while doing activities daily and to perform well throughout the day. Lack of sleep can lead to various physical effects like insomnia, fatigue, and hypertension. This can lead to cognitive impairment such as reduced performance, attention and motivation; decreased mental concentration, intellectual ability and complications related to mental health. Insufficient rest weakens the ability to think, manage stress, preserve a healthy immune system, and regulate and control

emotions. This makes it imperative to have wellness awareness programs and clinics in place. The issue is not limited to one or two individuals. Majority of the people have already got affected and many more are continuing to get affected. (¹³ Carakasamhitā Sutrasthāna, ¹⁴ Carakasamhitā Sutrasthāna, ¹⁵ Carakasamhitā Sutrasthāna, ¹⁶ Suśrutasaṁhitā Sutrasthāna)

Data analysis - The data generated were analyzed using Minitab 17 (Statistical Software). Frequencies and percentages were used to analyze the data generated from each section. It was decided to set the statistical tests level of significance at p = 0.05.

Key findings: Majority of the 307 respondents have been found adhering to good sleeping practices and there is a very low prevalence of lifestyle disorders viz. Hypertension, Diabetes Mellitus, Ischemic Heart Disease, among them. It was observed that bowel habits (anulomana) and appetite (agni) are highly influenced by the quality of sleep. In spite of an overwhelming majority of participants waking up at around 6 AM, there is a considerable population that wakes up post 8 AM.. There is evidence that such non-adherence is contributing to the disruption in agni thereby influencing the health profile. Perceived obesity is also influencing the health profile which is paving the way for stress management modalities like yoga.

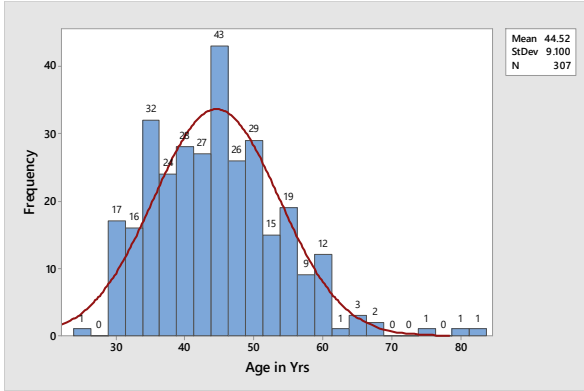
Results/ Statistical Analysis of the Data:

.Grading				
Blood Pressure	No	Recent	2-5	>5
	0	1	2	3
DM	No	Recent	2-5	>5
IHD	No	Yes (On MM)	Yes (ReVasc)	Unsure
	0	1	2	0.5
Obesity	0	1		0.5
Stamina	No	Moderate	High	Unsure (Little)
	0	1	2	0.5
Offers for Wellness	No	Yes		Unsure
	0	1		0.5
Quality of Sleep	Not Good at All	Somewhat Good	Good	Very Good
	0	1	2	3
Bowel Habits	Constipation Requiring Regular Medicine	Constipation Requiring Medicine Sometimes	Somewhat Good	Very Good
	0	1	2	3
Appetite	Bad	Not So Good	Good	Very Good
	0	1	2	3

Tab. 2. Grading for the responses given by the participants.

Total number of the participants- Among the total 307 participants, the number of male participants was 153 (49.8%), and that of female participants was 154 (50.2). There was almost equal presentation of both the genders.

Age of the participants

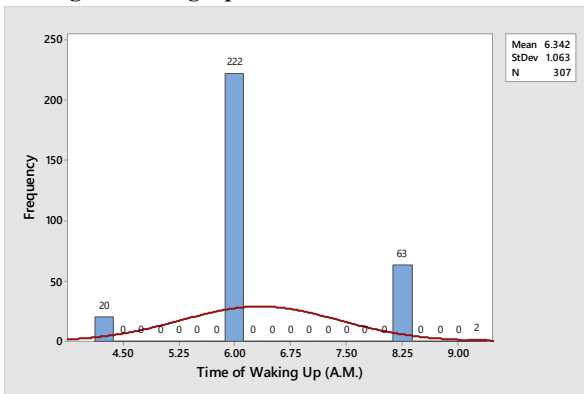


	Minimum Age (Years)	Maximum Age (Years)	Mean Age (Years)	Standard Deviation (SD)
Overall	25	83	44.52	9.1
Males	25	59	48.83	7.5
Female	31	83	44.62	9.0

Occupation/ Profession of the Participants-

Majority of the participants (60%) belonged to some kind of medication profession (practitioners, teaching faculties in medical colleges, public health professions). The number of participants from other service areas was just above 26%. Some farmers (4.9%) also responded to the questionnaire.

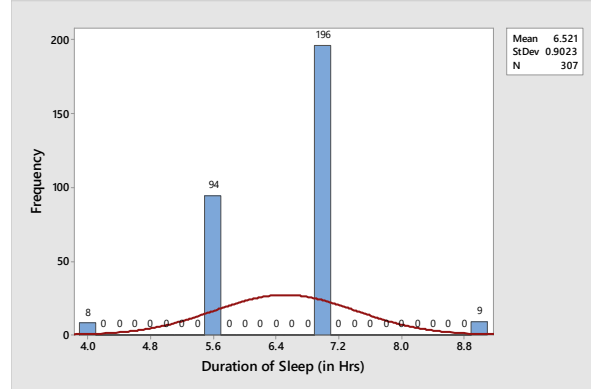
Timing of Waking Up-



Over 70% of the studied population was observed complying with the requirement of waking up early in the

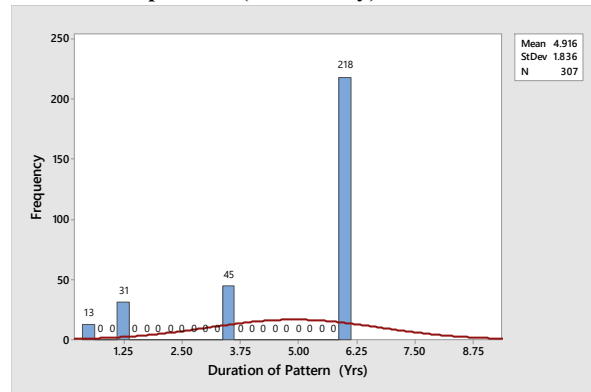
morning. This was followed by another 20% of the participants who have had the habit of waking up from 7 am to 9 am. We still see that many old aged people as well as spiritually inclined people like to get up early and meditate. The population studied was not necessarily aware of the importance of getting up at this particular time period. But traditionally, it has been observed that waking up in Brahma Muhurta is very helpful and healthy. One must be getting benefited from the geophysical and metaphysical effects of this.

Duration of Sleep



It was observed that over 63% (196) participants were spending 6-8 hours in sleeping (average 7 hours). This was majority among the sample under consideration. About 30% (94) use to sleep for 5 to 6 hours (average 5.5 hours). There was almost equal number of population in whom the duration of sleep was less than 5 hours (2.6%, 9) and greater than 8 hours (2.6%, 8) respectively.

Duration of pattern (consistency)

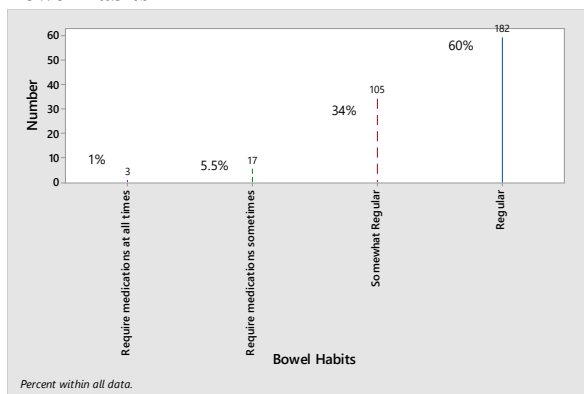


It was also important to know how long and consistent was this duration of sleep each individual is enjoying. It was found that it was not consistent in all. 71% (218) answered that they are sleeping for a particular duration more or less consistently since more than 5 years. The

consistency was more than 2 but less than 5 (years) in 14.7% (45) participants. About 14% (44) participants reported that their pattern was inconsistent earlier and it is somewhat consistent since last 6 months to 2 years.

Quality of sleep is one's self-satisfaction related to all the attributes of the experience associated with sleep. Sleep efficiency, sleep latency, sleep duration, and wake after sleep onset with a feeling of freshness are the attributes of sleep quality. Good sleep quality has positive effects on health, both physical and mental. 89 (29%) participants found enjoying very good quality of sleep. They told that they remain fresh and energetic throughout day. Good sleep was experienced by 122 (39.7%) individuals. Significant number of people 75 (24.4%) have had symptoms indication no so good quality of sleep. There were 21(6.8%) participants who confessed that they struggle to get good sleep. They reported it as 'not good at all and that they don't feel energetic after waking up.

Bowel Habits



Among the participants, near 60% (182) reported that their bowel habits are good and regular. About 34% (105) reported that they have mild degree of constipation, and have some issue with regular evacuation, but don't require or any medication to manage it. The percentage of people having significant bowel evacuation issue was 5.5% (17). This group accepted that they take some or the other medication for that. Very few people, i.e. 1% (3) only, confessed that they have severe constipation and cannot manage without laxatives.

Appetite

Sleep disturbances are associated with obesity, insulin resistance (responsible for causing diabetes), appetite dysregulation and hormonal imbalance. There were few participants (14, 4.6%) who could not perceive it correctly and were unsure about their individual

perception of appetite. Such people don't any have fixed and regular pattern, and usually suffer, sooner or later. 32 (10.4%) reported that their appetite was not so good. But they take their food at a fixed time in a day. This is also is not a perfectly healthy habit to follow. The number of people who reported having good appetite was 106 (34.5%). They told that feel hungry at certain time but take food at some other time, occasionally, due to some reasons. Half the population studied i.e. 155 (50.5%) told that they feel that they have very good appetite as they feel hungry almost at a fixed time daily and take food at that time only.

Exercise –

Good amount for sleep restores the freshness and energy to start one's day with enthusiasm and stamina. If an individual performs some kind of exercise on most of the days, his or her sleep improves. This is true with majority of the population. Fair amount of exercise (moderate-to-vigorous) can enhance sleep quality, mostly for adults by reducing sleep onset. Sleep onset is the time a person takes to fall asleep. It also helps reduce the amount of time one lie awake in bed in the night. Also, physical activity facilitates lessen sleepiness during daytime, also for others; it reduces the dependency on sleeping pills. Studies have shown that in adults practicing Yoga, there are less episodes of disturbed sleep and these people enjoy better overall sleep quality most of the time.

It was asked whether the participants perform exercise, and/ or yoga or pranayama. It was observed that there were 95 (31%) who were performing exercise for more most of the days in week. The number of people doing yoga from the same population was 85 (27.8%). 158 (51.5%) were not doing the exercise on less than 3 days a week, while the number of participants doing the yoga irregularly was 136 (44.2%). This is significant, as it would not bring the desired effects as yoga is something which has to be practiced regularly. The number of individuals not doing the exercise at all and not doing the yoga at all was 54 (17.6%) and 86 (28%) respectively.

Frequency of Meals

Frequency and time of meals also can affect the sleep. About 48% (147) participants used to have meal only twice day. The number participants taking meals thrice a day was 141 (46%). Very few, i.e. 13 (4.2%) confessed that they take meals on four or more occasions in a day. 6 (2%) denied sticking to any particular frequency. Regression analysis was used to assess the strength of the relationship between variables. Analysis of Variance was done to find out the statistically significant association between the factors studied.

Hypertension, Diabetes Mellitus and Ischemic Heart Disease-

As it is known, it was found that the

- Age has strong association with development of all these three conditions ($p=0.00$, 0.00 and 0.02 resp.)
- Occupation/ profession was also having some impact on the blood pressure and perception of overweight ($p=.01$ and 0.06 resp).
- Frequency of meal was found related to the alteration in blood pressure ($p=0.04$), and diabetes mellitus ($p=0.08$)
- Time of waking up, duration of sleep and quality of sleep are not found having any direct and statistically significant association with these.
- Bowel habits and appetite appear to be linked with the diabetes mellitus ($p=0.01$ and 0.08 resp.)
- More than exercise, yoga and pranayama are found effective in preventing/ managing diabetes and ischemic heart disease ($p=0.00$ and 0.01 resp.)
- Frequency of meals was found having some link with hypertension and diabetes ($p=0.04$ and 0.08 resp.)

Stamina/ Energy and Perception of Overweight-

- Among the factors studied, duration of sleep ($p=0.00$) was found impact on perception of overweight and quality of sleep appears to be strongly related with the enjoyment of stamina or energy in day to day life ($p=0.00$)
- Bowel habits also have some association with perception of overweight ($p=0.08$) overall stamina ($p=.09$)

Bowel Habits-

- Bowel habit was found having strong association with quality of sleep ($p=0.00$), appetite ($p=0.00$) and some association with the duration of sleep ($p=0.09$).

Appetite-

Equally, the appetite was found affected positively by the quality of sleep ($p=0.00$) and by bowel habits ($p=0.00$). As it was overall lifestyle, good, not so good or bad, with respect to complying the requirement of listening to the signals from body and 'controlling and regulating' our senses including mind, is the key to maintain and sustain health. For those, who are not aware of this or are not able to achieve this, there has to be provision of some program wherein the people would be trained on various aspects of health and strategy to handle it effectively and efficiently. Majority of the participants (221; 72%), expressed that they would want such programs to be in place and

functional and that they would be a part of it. Very few people (7, 2.3) did not find any need of such program.

DISCUSSION

The cross sectional study intended to look into the status of sleeping pattern and its impact of lifestyle disorders, if any. The respondents were equally divided into either gender. It makes the observations more matched and devoid of gender bias. Although the questionnaire was circulated with free access to all young adults, it got more response within the ranks of medical professionals. It is perceived that the persons with a medical background are more oriented towards the healthy living habits including the sleeping habit. The observations also support this perception as over 70% of the respondents rise early in the morning. The early-risers although are not all medical professionals. They are inclusive of a few from other occupations also. It was an observation that spiritually inclined persons have a habit to get up early. If the majority chunk of respondents is basically sensitized about healthy sleep pattern and hence has a healthy duration and consistency of sleep; it is quite clear that it is followed by the quality of sleep too. Ayurvedic school of thought has attributed almost one-thirds of the health to the sleep pattern as one of the 3 pillars of life. As explained by Ācārya Kaśyapa, falling asleep and getting up with the pleasure is an important indicator of health. Nidrā is the function of the mind which blocks all the perception from external world. While one is sleeping, his mind is oriented towards the feelings from within. This is what Patanjali had to say about sleep. On the similar lines, Ācārya Caraka has said that during the state of nidrā, tiredness of the body brings about detachment from bāhya, viśaya i.e. external worldly subjects. Nidrā taken at particular time with a consistency has led to the good quality of sleep. Vāgbhaṭṭ has called nidrā (sleep) as tamomayī. The night time is tamodhika naturally. The night time helps to make mind tamodhika, the body kaphādhika and the indriya inactive. Thus it brings in ideal pattern of sleep, leading there to good quality of sleep followed by tendency to rise early. The findings in the study are a re-iteration of this principle.

Normal evacuation of bowels and urine is also an important attribute of health. The early morning time is very conducive to generate a natural urge of defecation. Hence a proper timing of waking has facilitated the improvement in the bowel habits. However, in case of a few with constipation, the observations can be viewed in the perspective of their other factors like koṣṭha. The bowel habit is an aftermath of the digestion. If the agni

(digestive ability) is proper, bowel habit is regular. This pattern is seen through the findings of this study as well. Those, who are regularly indulged in some kind of physical and/or breathing exercised and yogic practices, tend to have good state of agni. It's a principle of Ayurvedic dinacaryā, that vyāyāma improves the state of agni. Agni governs all metabolic activities. Hence vyāyāma is helping out to prevent metabolic lifestyle disorders like DM (Diabetes Mellitus) and IHD (Ischemic Heart Disease). The perception of obesity is also reduced with proper evacuation of excreta due to good state of agni. This has been termed as laghutva.

There are 5 kinds of vāyu depending on the zones they are operating within human body. prāṇa vāyu is responsible for food intake and vyāna is responsible for circulation. The study has established an association between frequency of meals and the hypertension. This fact points out that the disruption at the first operational zone of vāyu adversely affects the subsequent zonal functions including the circulatory function. Also, the association between bowel habit – appetite and DM indicated towards the fact that improved state of agni leads to proper bowel habit that is a sign of proper carriage and the disposal of kleda (waste). It's an established principle that the occurrence of DM is directly proportional to the increase and stagnation in the kleda.

Appropriate sleep imparts pleasure and increase the life, according to Caraka. Further Caraka states that sukha-duḥkha, puṣṭi-kārśya, bala- abala, vṛṣatā -klibatā, jñāna-ajñāna are the attributes of proper or improper sleep respectively. Our study has noticed an important association between quality of sleep and stamina. puṣṭi (nutrition), bala (strength), utsāha (enthusiasm), agnidipti (improvement in appetite) and in turn, dhātusāmya (equilibrium of dhatus) are the benefits of proper sleep according to Ācārya like Suśruta and Bhāvamiśra. This association itself is a revalidation of this principle. Whenever a cross sectional study is conducted, the findings are viewed in the light of various variations. As āyurveda has adopted an extremely individualistic approach towards dealing with the health of every individual, these variations acquire even more importance. Sleep is also no exception to it. Quantity of sleep cannot be generalized to everyone due to difference in prakṛti, āhāra, vyavasāya, sātmya-asātmya, vāyu, ṛtu etc. Dakṣa smṛti has stated that 2 yama i.e. 8 hours is the ideal duration of sleeping. However, suśruta has directed that a person should sleep for the period appropriate for him. The observations in this study are also in accordance with this opinion of Suśruta.

The circadian rhythm and the sleep pattern is affected by a number of factors. The physiology of the human body-mind complex is run by the equilibrium of doṣa, dhātu and mala. This balance is adversely affected with disruption in lifestyle. That leads to altered metabolism and subsequently brings in lifestyle disorders. Sleep, being a significant factor of lifestyle, ought to have impact on the digestion, metabolism, nutrition and health in general. Disrupted sleep in terms of quantity, consistency and quality leads to the disruption in agni-vyāpāra .e. metabolic activities. The number of observations in this cross sectional study substantiates the role of sleep pattern as a healthy lifestyle modality and also as a potential factor in the occurrence of lifestyle disorders. As most of the respondents were oriented towards healthy living habits, their willingness be a part of wellness program was appreciable.

CONCLUSION

The cross-sectional Study on the Lifestyle vis-à-vis Lifestyle Disorders in Young Adults with reference to the Sleep Pattern infers that adherence to good sleeping practices leads to a very low prevalence of lifestyle disorders. Bowel habits and appetite are also found to be influenced by the quality of sleep. The better is the sleep quality, better is the agni and thereby better is the metabolic function.

How this study benefits to: Building new knowledge: The observations indicate that the population at risk is already aware of the risk and hence is adhering to good sleeping habits. The Ayurvedic concepts like nidra and agni are totally relevant in contemporary times also.

Research community: The re-iteration of the concepts of Ayurveda has been brought to the notice of the research community, which is the need of the hour.

Society at large: The population at risk has adopted good sleeping practices and is by and large having a fair health profile. There is a positive quest for a wellness module among the respondents, which will benefit the society at large.

Conflict of Interest- None

REFERENCES

- Jean-Philippe Chaput, Caroline Dutil, and Hugues Sampasa-Kanyinga (2018), Sleeping hours: what is the ideal number and how does age impact this? Nature and science of sleep , 10, pp. 421–430. <https://doi.org/10.2147/NSS.S163071>.
- Cibele Aparecida Crispim , Ioná Zalzman Zimberg, Bruno Gomes dos Reis, Rafael Marques Diniz, Sérgio Tufik, Marco Túlio de Mello (2011), Relationship between food intake and sleep pattern in healthy individuals. Journal of clinical sleep medicine 7(6) , 659–664; <https://doi.org/10.5664/jcsm.1476>.

- Eric P. Widmaier, Hershel Raff, Kevin T. Strang, (2008), Vander's Human Physiology, Eleventh Edition. McGraw-Hill Higher Education, Pg. 235.
- Eric P. Widmaier, Hershel Raff, Kevin T. Strang, (2008), Vander's Human Physiology-THE MECHANISMS OF BODY FUNCTION, Eleventh Edition, Pg. 671. Mc-Graw Hill .
- Michele Ferrara, Luigi De Gennaro (2001), How much sleep do we need? *Sleep Med Rev.* , 155-179; doi: 10.1053/smr.2000.0138. PMID: 12531052.
- Guglielmo Beccuti and Silvana Pannaina (2011), Sleep and obesity, *Curr Opin Clin Nutr Metab Care.* 2011 July ; 14(4): , 402–412. doi:10.1097/MCO.0b013e3283479109.
- Guyton, Arthur C. and John E. Hall. (2006). Textbook of medical physiology (Pg 972-973). 1600 John F. Kennedy Blvd., Suite 1800, Elsevier Inc.
- Dennis L. Kasper, MD
Anthony S. Fauci, Stephen L. Hauser, Dan L. Longo, J. Larry Jameson, Joseph Loscalzo, (2016). Harrison's Manual of Medicine eBookPg. 245. McGraw-Hill Education.
- Iyas Daghlas, Jacqueline M Lane, Richa Saxena, Céline Vetter (2021), Genetically Proxied Diurnal Preference, Sleep Timing, and Risk of Major Depressive Disorder. *JAMA Psychiatry* , 78(8):903-910. doi:10.1001/jamapsychiat.
- Meena S Khan, Rita Aouad (2017), The Effects of Insomnia and Sleep Loss on Cardiovascular Disease. *Sleep medicine clinics*, 12(2) , 167–177; <https://doi.org/10.1016/j.jsmc.2017.01.005>.
- Goran Medic, Micheline Wille, and Michiel EH Hemels (2017), Short- and long-term health consequences of sleep disruption. *Nature and science of sleep* , 9, 151–161; <https://doi.org/10.2147/NSS.S134864>.
- Michiaki Nagai, Satoshi Hoshide, Kazuomi Kario (2010), Sleep Duration as a Risk Factor for Cardiovascular Disease- a Review of the Recent Literature. *Curr Cardiol Rev.* 2010 Feb; 6(1), 54–61.
- Michiaki Nagai, Satoshi Hoshide, Mami Nishikawa, Kazuyuki Shimada, Kazuomi Kario (2013), Sleep duration and insomnia in the elderly: associations with blood pressure variability and carotid artery remodeling. *American journal of hypertension*, 26(8) , 981–989. <https://doi.org/10.1093/ajh/hpt070>.
- Narayanan, A. (2020). Creator's time -The Brahma Muhurta. *Psylenze; PSYCHOLOGY ASSOCIATION | DEPARTMENT OF PSYCHOLOGY | PSG COLLEGE OF ARTS & SCIENCE* , Dec 2020, Volume 6 Issue 2, Pg. 12.
- Alexander D Nesbitt (2018), Delayed sleep-wake phase disorder. *J Thorac Dis* , 10:S103.
- M M Ohayon 1, R E Roberts, J Zulley, S Smirne, R G Priest (2000), Prevalence and patterns of problematic sleep among older adolescents. *J Am Acad Child Adolesc Psychiatry* , 39:1549.
- Kishor Patwardhan (2012), The history of the discovery of blood circulation: unrecognized contributions of Ayurveda masters. *Adv Physiol Educ.* , 36:77–82.
- Report on WHO technical meeting on sleep and health at Bonn Germany, 22-24 January 2004. Available from https://www.euro.who.int/_data/assets/pdf_file/0008/114101/E84683.pdf accessed on 22/06/2021.
- Børge Sivertsen, Allison G Harvey, Michael Gradisar, Ståle Pallesen, Mari Hysing (2021), Delayed sleep-wake phase disorder in young adults: prevalence and correlates from a national survey of Norwegian university students. *Sleep Med* , 77:184.
- Sushruta Samhita (1911) by Kaviraj Kunja Lal Bhishgratna Piyush Kumar Tripathi, Kishor Patwardhan, Girish Singh (2011), The basic cardiovascular responses to postural changes, exercise, and cold pressor test: do they vary in accordance with the dual constitutional types of Ayurveda? *Evid Based Complement Altern Med* , doi:10.1155/2011/25185.
- Wei-Li Wang, Kuang-Huei Chen, Ying-Chieh Pan, Szu-Nian Yang, Yuan-Yu Chan (2020), The effect of yoga on sleep quality and insomnia in women with sleep problems: a systematic review and meta-analysis. *BMC psychiatry*, 20(1) , 195. <https://doi.org/10.1186/s12888-020-0>.
- Susan L. Worley (2018), The Extraordinary Importance of Sleep: The Detrimental Effects of Inadequate Sleep on Health and Public Safety Drive an Explosion of Sleep Research. *P & T : A peer-reviewed journal for formulary management*, 43(12) , 758–763.
- Suśruta Saṁhitā, Commentary by Ācārya Dalhaṇa, Edited by Vaidya Yādavajī Trikamaṇī Ācārya, Edition 2012, Caukhambā Saṁskṛta Pratiṣṭhāna.
- Aṣṭāṅga Hṛdaya, Commentary by Aruṇadatta Edited by Anṇa Kunṭē, Edition 2011, Caukhambā Saṁskṛta Pratiṣṭhāna, Vārāṇasī.
- Caraka Saṁhitā, Commentary by Cakrapāṇi Edited by Vaidya Yādavajī Trikamaṇī Ācārya, Edition 2012, Caukhambā Saṁskṛta Pratiṣṭhāna, Vārāṇasī.
- Aṣṭāṅga Saṁgraha, Edited by Dr. Padmākara Āṭhavalē, Edition 2000, Caukhambā Saṁskṛta Pratiṣṭhāna, Vārāṇasī.
- https://www.carakasamhitaonline.com/index.php?title=Website_guide&oldid=40451, Publisher name : Charak Samhita Research, Training and Skill Development Centre (CSRTSDC), City of publication : Jamnagar, India; Year of publication : 2020; Edition no. : 01 ||Suśrutasaṁhitā||
- <https://niimh.nic.in/ebooks/esushruta/Suśrutasaṁhitā,Śrīdalhaṇācāryaviracitayā,CaukhambāSaṁskṛtaPratiṣṭhāna,Vārāṇasī>