

Sleep medicine education in India

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Abstract India is an ancient country with a vast population, diverse geography and culture. Although sleep medicine has been rapidly progressing during the last decade in the country, the ancient Indian literature is rich in descriptions of sleep physiology and the importance of sleep in life. In spite of rapid industrialization and the emergence of a modern 24/7 h society, knowledge about sleep and its disorders is lacking amongst the general public and doctors. A need is felt to raise the level of awareness of sleep to that of the level of nutrition and exercise. There is shortage of trained certified sleep specialists and technicians to meet the emerging demand. A need is felt to provide standardized sleep health care service. The role of professional sleep societies, industry, private enterprises and government agencies in promoting sleep medicine education in the country is emphasized. Vertical integration of education in sleep physiology and disorders, from school level to graduate and postgraduate medical education, is advocated. To create specialists in the discipline, horizontal integration with physiology, neurology, psychiatry and pulmonary medicine is a viable solution in this multidisciplinary subject. The government should recognize sleep as an important public health issue.

Keywords Sleep medicine · Sleep education · Sleep clinics

Introduction

When William C. Dement, the father of modern sleep medicine, did premedical at University of Washington in 1951 and MD in Physiology at the University of Chicago in 1955, sleep medicine was an unknown entity. Later Dement established the world's first Sleep Disorders Clinic at Stanford University in 1970. Today sleep science is an exciting and diversified field, as over the last 50 years or more, we have learnt a lot about the mystery of sleep, the nocturnal beauty. We have used all tools of modern molecular biology, electrophysiology and imaging techniques to address scientific questions in sleep science. In spite of the great leaps that we have made, even in the most affluent countries, the general public is still ignorant about the importance of sleep. In this context, it is very pertinent to quote from the famous book of Dement *'The Promise of Sleep'*: "AFTER ALL THE RESEARCH I've done on sleep problems over the past four decades, my most significant finding is that, ignorance is the worst sleep disorder of them all" [1]. People lack the most basic information about how to manage their sleep, leading to a huge amount of unnecessary sufferings. The fact is that both doctors and general public know almost nothing about vast store of advancement in modern sleep medicine and sleep physiology. Awareness about sleep and sleep disorders amongst doctors and the general public including our children and administrators is the need of the hour. We will not only live a healthy life but also prevent many unwanted deaths.

Rapid modernization is not only changing our life style, but also affecting our sleep. At this juncture it is important

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to educate the public and health professionals on the benefits of good sleep, consequences of sleep deprivation and sleep disorders. Professor Soichiro Miyazaki from Shiga University, Japan, has shouldered the important task of bringing out a special issue on ‘Sleep medicine education in Asia’ to take stock of the current situation and plan for our future for better sleep health and treatment strategies.

Sleep medicine in India: the glorious past

Vedas and Upanishads (probably dating back to 3500 BC) have classified the states of consciousness as (1) *Jagratastha* (waking phase), (2) *Swapnavasta* (dream phase), (3) *Susuptavasta* (sleep phase) and (4) *Samadhi avastha* (conscious sleep phase). The first three stages have been scientifically described, but the modern science has yet to demonstrate electro-physiologically (or through some other technique) the fourth state of consciousness. During the Eighth Asian Sleep Research Society Congress in Kerala (India), many of us might have visited the most famous Lord Vishnu Temple, the Sree Ananda Padmanabhaswamy Temple in Thiruvananthapuram. Here the Lord Vishnu is enshrined in the *Ananthasayanam*, i.e. ‘Yoga Nidra’ or yogic sleep posture. At many places in India, one can find statues of Lord Buddha in many beautiful sleeping postures, emphasizing the importance of sleep in life. The solar time wheel carved out of red stone at the World Heritage site Konark on the east coast of India shows day and night human activities in pictorial forms. The importance of sleep and sleep hygiene has been amply advocated in ancient literature and paintings. Lord Krishna has explained the importance of proper sleep for *adhyana yogi* in Bhagavad Gita. He also mentions to Arjuna that excessive sleep or awaking is not good.

Sleep medicine in traditional school of Indian medicine

When we talk about patient care, what comes to our mind is modern medicine which has a short history, especially for sleep medicine. But the traditional school of Indian medicine, Ayurveda, practiced since ages in India, is still preferred by a large population for all their ailments. As most readers are not likely to be familiar with Ayurveda, the procedures adapted in this traditional Indian medicine are described here in some detail. Ayurveda considers *Nidra* (sleep) as one of the three supporting sub-pillars of good health. Information about ayurvedic medicine is available in the *Samhitas* (encyclopaedias), written in Sanskrit around 1000 BC, by the great scholars Charaka and Sushruta. Ayurveda advocates a holistic approach for

treating sleep disorders wherein the physical, mental, and spiritual attributes of a patient are emphasized, rather than focusing on the disease, as in conventional modern medicine [2]. The Ayurvedic *Samhitas* describe about 700 medicinal plants, 64 preparations from mineral sources, and 57 preparations based on animal sources [3, 4]. Active principles have been identified in about 38 herbs that have been reported to have sedative effects [5].

The physical procedures advocated for management of sleep disorders aim at physical and mental relaxation. These procedures include *Shirodhara* that involves pouring herbal medicine mixed with warm oil or water over the forehead, *Shirobasti*, in which medicine is retained above the head with the help of a head band, *Utsadana*, where they are applied all over the body with gentle friction by an expert hand. Body massages employed in treatment of sleep disorders in ayurveda include *Abhyanga* massage, where medicated oil is applied with pressure, and *Samvahanana*, where massage is given in soft stroking motions. Dietary advice always forms part of any ayurvedic treatment. Consuming milk, rice with curd, alcohol, meat soup are some of the most common suggestions given for getting good sleep. Ayurvedic physicians do recommend yogic exercises and meditation to improve the sleep quality. Ayurveda does recognize prayer as one form of treatment.

Ayurveda stresses on the importance of purification of the body (*panchakarma*) before other corrective measures are taken. So, some of the ayurvedic treatments for both *anidra* (sleeplessness) and *nidradhikya* (excessive sleep) are aimed at purification of the body. There is an emphasis on maximizing the body’s innate ability to heal itself. Ayurvedic medical interventions involve individualized diagnosis, before herbal medications and other procedures. During clinical examination, the patient is evaluated on the basis of a unique concept of psycho-physiological body type, which forms the cardinal principle in the ayurvedic approach to health issues. According to this concept our physical and psychological constitution is determined by three *Dhatus* (basic factors) in the body, namely *Vata*, *Pitta* and *Kapha*. These terminologies cannot be appropriately translated into any other language, as they do not have any equivalent in modern physics, physiology and medicine [6, 7]. When these basic factors are aggravated or deranged, they bring about health problems like *nidradhikya* with increase in *Kapha*, and *anidra* with increase in *Vata* [3, 4].

The sleep medicine in India: the beginning

As in the case of western world, the history of sleep research in India is older than the history of modern sleep medicine in India. As it had happened in the west, these early sleep researchers paved the way for the development

of sleep medicine in India. In India sleep research started at the Department of Physiology, All India Institute of Medical Sciences (AIIMS), New Delhi, when Baldev Singh joined as emeritus professor in 1965. He along with T Desiraju and V Mohan Kumar laid the foundation for sleep research in India. They recorded the electrical activity of cortical and sub-cortical regions in unanaesthetised rats, cats and monkeys, and human volunteers. Their work attracted many eminent overseas sleep scientists like Mauro Mancia from Milan, who came to work on sleep physiology in monkeys in the department. Mancia was a disciple of Giuseppe Moruzzi, the co-discoverer of Ascending Reticular Activating System.

The Department of Physiology organized the first scientific meeting in India on sleep research and sleep medicine titled ‘International Congress on Sleep-Wakefulness’ under the leadership of V Mohan Kumar during September 1992. This academic sleep meeting made a big dent amongst the medical community in India and marked the beginning of modern sleep medicine in India. During this international conference, the Indian Society for Sleep Research (ISSR) was founded. Along with that, the founding committee for the Asian Sleep Research Society (ASRS) was also constituted. The formation of the ISSR gave a significant boost to sleep research and sleep medicine in India.

The health care system in India

It is necessary to mention about the health care system in the country to understand the issues related to sleep medicine in India. Health insurance is a recent phenomenon in the country and it can be availed of only by the privileged “haves”, but it is a distant dream for the large number of “have-nots”. In a country of more than 125 million people, the health care system is not only multiplex but also complex. Health care for patients starts from primary health care centres. From there the patient goes to district headquarter hospital, to medical college hospitals and super speciality hospitals, to seek medical attention for more complicated cases. The medical care is free or subsidized in government hospitals.

Sleep hygiene is the major issue for the poorer section of the society. Their sleeping environment, with insect bites and extreme weather conditions, makes their sleep repeatedly interrupted and extremely uncomfortable. Moreover, India has a large workforce which works on night shifts, due to power shortage during the day. Power is made available to the factories primarily at night. This also adds to the sleep problems of unprivileged section of the society. Unfortunately most of these unprivileged do not even realise that they have a sleep problem. In fact, most

sleep problems are reported only by the privileged few in the society.

Complaints of sleeping late and getting up late are recent phenomena, primarily among the affluent class. Most common sleep complaints amongst the patients are insomnia and fragmented sleep. Insomnia is treated by physicians at all level either symptomatically or scientifically. Besides insomnia, other mostly reported sleep disorders are hypersomnia, parasomnia and obstructive sleep apnoea. There is a general lack of awareness about narcolepsy, rapid eye movement (REM) sleep behavioural disorders and restless legs syndrome amongst primary health care providers. Common symptoms of sleeplessness and excessive sleep are treated by general practitioners. Traditionally sleep medicine was considered to come under the domain of neurology and psychiatry. More recently the pulmonologists have emerged in large numbers to treat sleep disordered breathing. Otorhinolaryngologists have also started surgical management of sleep disordered breathing. Though there is not much participation by dentists, their interest in the subject is also growing. Speciality sleep clinics are very few and confined to metros. Majority of sleep centres belong to pulmonologists. There are more than 300 sleep centres in the country, though the number of sleep specialists certified by American Board of Internal Medicine is about five or six.

The number of Registered Polysomnographic Technologists (RPSGT) is about 10. As sleep medicine is practiced by different kinds of specialists, the patients are left in a radial maze. There are no comprehensive centres for sleep disorders in India. A comprehensive centre for sleep disorders, envisaged to be established at Sree Chitra Tirunal Institute for Medical Sciences & Technology in Thiruvananthapuram, by V Mohan Kumar, to fulfil the gap in sleep medicine, research and education, is still a dream.

Sleep medicine and the pulmonary medicine community

It will be an unfinished story if we do not touch upon the role of pulmonologists in the growth of sleep medicine in India. Rapid expansion of sleep medicine in India occurred when it became evident that obstructive sleep apnoea syndrome is a major health issue, and non-invasive positive pressure ventilation is an accepted treatment mode. Though sleep was recorded and analysed on the basis of EEG, EMG and EOG on human subjects at AIIMS Delhi, from late 1960’s, the first human polysomnography (PSG) laboratory was established in pulmonary medicine department in Safdarjung Hospital in New Delhi in 1995 by J C Suri. He also started a professional sleep society, named as Indian Sleep Disorder Association (ISDA), with fellow

pulmonologists. ISDA also brings out a journal quarterly titled 'Indian Journal of Sleep Medicine'. The clinical interest in sleep disorders grew rapidly in India, as the industry saw a big business opportunity in sleep medicine in this country with a population of more than 125 million. Rapid growth of sleep laboratories without qualified or trained sleep health professionals is a problem that needs to be tackled not only at the professional level, but also at political and administrative levels.

National Sleep Medicine Course

The National Sleep Medicine Course launched in India in 2006 (Fig. 1; Table 1) by the ISSR is the biggest annual teaching platform for sleep medicine in this country. The 'needs assessment analysis' during the Second Interim Congress of the World Sleep Federation (WSF) in New Delhi during September 2005 highlighted the urgent need for a sleep medicine education initiative in India. To fulfil

this aim, the National Sleep Medicine Course (NSMC) was organized in collaboration with the academic faculty from the USA, Japan and India. The ISSR sponsored NSMC is designed to serve as an educational platform for the practicing and in-training physicians, as well as other health care professionals. The NSMC recognizes the fact that during these transition times of scientific growth, not every doctor has received formal education in the basic science of sleep, nor the clinical practice of sleep medicine. NSMC wishes to carry out a mission that fulfils the void left in our mainstream educational system. The course is intended to provide education in basic science, technical aspects and clinical science of sleep medicine to the Indian medical fraternity.

The first NSMC was organized at AIIMS, New Delhi during October, 2006, on an experimental basis under the initiative of Deepak Shrivastava from UC Davis, California. The overwhelming response and clinical success of the NSMC 2006 have encouraged ISSR to continue the programme annually since 2006 on a regional basis under the



Fig. 1 Glimpses from National Sleep Medicine Courses

clinical leadership of H.N.Mallick, Deepak Shrivastava and the other dedicated US colleagues of Indian origin.

The course is designed to cover major topics in Sleep Medicine over two days of didactic sessions and workshops. The subjects included in the course are sleep physiology, neurology of sleep, neuro-pharmacology, insomnia, sleep disordered breathing, sleep and epilepsy, circadian rhythm disorders, cardiovascular complications of sleep apnoea, narcolepsy, sleep evaluation methods, restless legs syndrome, cognitive behavioural therapy, paediatric sleep disorders, parasomnias and sleep hygiene.

National Sleep Technology Course

The field of sleep medicine has grown significantly due to increased public awareness of sleep disorders. Sleep laboratories are coming up rapidly. There is an acute shortage of trained and certified sleep technicians. With this growth has come the need for accessible educational opportunities for PSG Technicians/Technologists who perform a crucial role in the diagnosis and treatment of sleep disorders. Apart from the skill needed for polysomnographic recording, the technicians should have some knowledge about sleep physiology, pathology and medicine to get certified by a competent professional body. The ISSR has been organizing National Sleep Technology Course (NSTC), every year since 2012. The aim of the course is to build a cadre of Polysomnographic Technicians (PSGT) who would become global leaders in sleep technology and provide high quality sleep technology services. It is also hoped to help sleep technicians to prepare for the RPSGT Examination. It will certainly help many talented young Indians to seek employment in the field of sleep medicine either in India or abroad.

Table 1 Shows the details of National Sleep Medicine Courses conducted in the past by Indian Society for Sleep Research

Year	Venue	No. of participants	No. of faculty
2006	New Delhi	45	10
2007	Bangalore	100	20
2008	Cuttack	60	20
2009	New Delhi	100	20
2010	Trivandrum	100	20
2011	Mumbai	100	20
2012	Bangalore	120	20
2013	Chennai	120	20
2014	Eighth Asian Sleep Research Congress, Kovalam, India		
2015	Guwahati	100	20

Board certified sleep specialists

It is necessary that each sleep medicine practitioner has comprehensive knowledge about sleep science and sleep medicine. The number of certified sleep specialists practicing in India, who are certified American Board of Internal Medicine, is limited to a single digit figure. Therefore, there is a need for certification in India, along the line of American Board of Sleep Medicine or American Board of Internal Medicine. The WSF came forward to conduct Transitional Board Certification Examination for Indian sleep specialists. Clete Kushida, the President of WSF, offered to assist in starting International Sleep Medicine Board Certification in five countries outside USA, including India. A ten member Indian Board of Sleep Medicine headed by a Chair was constituted in 2010 by the ISSR for this purpose. This committee is responsible for setting the qualifications to appear for the examination, and for ensuring that a given candidate is eligible to sit for the examination, determining the examination cutoff point, and for signing and distributing the certificates of completion. The WSF has conducted four examinations for Indian Specialists from 2012 to 2015, and it will conduct an examination in July every year on behalf of the Indian Board of Sleep Medicine. So far 15 candidates have passed this board certified examination and they are deeply engaged in the practice of sleep medicine. The ISDA has also conferred honorary fellowships on around 22 sleep medicine practitioners. ISDA also runs a 1-year fellowship programme in sleep medicine in some selected satellite sleep centres.

Certification Examination for Sleep Technicians

The Certified Sleep Technician (CST) Examination assesses the professional competence of technicians who perform routine adult PSG and basic CPAP titration for sleep apnoea. This examination is geared towards individuals who would like to acquire proficiency in this field. This examination will also help the candidates to take up RPSGT examination which is considered the gold standard in conferring sleep technologist credentials. A successful candidate will have basic knowledge of sleep apnoea and other sleep disorders, instrumentation, scoring rules for sleep stages, arousals, respiratory events, EEG waveform morphology, sleep physiology, respiratory physiology, cardiac physiology and CPAP titration. The first Sleep Technician Certification Examination was conducted by Indian Board of Sleep Medicine under ISSR in November 2015.

Sleep laboratories accreditation

Recently there is a rapid growth in Sleep Medicine in our country. However, the number of sleep physicians is not enough to cope up with this development. The sleep laboratories are outnumbering the sleep physicians. The availability of trained/certified sleep technicians is also limited. There are more than 300 sleep laboratories in the country. Many sleep laboratories are generating reports without any scoring by a sleep technologist or specialists. There is no uniformity or any prescribed standard followed in reporting. As a national professional society, the ISSR has volunteered to offer an accreditation programme for Sleep Medicine Centre and Sleep Testing Laboratories with the purpose of bringing quality health care in sleep medicine. Accreditation of sleep medicine centres and sleep laboratories is essential to ensure and improve patient care. The Neurology and Sleep Centre in New Delhi is the first sleep centre to be accredited by Indian Board of Sleep Medicine.

Sleep science and education across the spectrum

The school going children in most of the cities in India are sleep deprived because of early school timing. Home work, preparations for examination, entrance tests etc. not only encroach on sleep time but also reduce physical activities and social interactions. Prolonged tension associated with examinations is not only bad for general health, but also affects sleep. Moreover, stress-related neuro-hormonal changes delay sleep onset, and thus disrupt the circadian rhythm. Other teenage related problems also affect sleep. The use of mobile phones, iphones, ipads and the blue light emanating from these gadgets have changed the sleep pattern of children in India. We need to insert issues of

sleep habit in the elementary and high school curriculum. Our educational system has taken initiatives to raise the level of information of teachers and parents on nutrition and exercise. But we have to take steps to raise the level of information about sleep amongst the teachers and students. As a major step towards public awareness programme, ISSR had conducted a seminar titled “Importance of Sleep for School Children” for the school teachers in New Delhi in 2015 (Fig. 2).

Role of industry and private sector in continuing sleep medicine education

Philips Respironics conducts multiple activities to promote sleep medicine in India. They provide a tiered and structured training and certification programme for doctors and technicians. They also conduct patient and public awareness programme to create awareness on sleep and sleep disorders. The Nithra Institute of Sleep Sciences in Chennai offers fellowship in sleep medicine. To fill the lacunae between formal medical training in sleep medicine and practicing health care professionals, two of our colleagues, Manvir Bhatia and Preeti Devnani, are running ACE School of Sleep Medicine, as a regular regional training programme. The mission at ACE school, with targeted weekend courses, provides a comprehensive curriculum in clinical polysomnography and sleep medicine. The courses at ACE school are designed to provide the participants with a practical comprehensive review and understanding of the pathophysiology, clinical symptomatology and management of sleep disorders. They provide tailor-made modules of different durations and variable syllabus. The school has organized several courses at regular intervals at various regions of the country. ISDA has introduced some fellowship in sleep



Fig. 2 Sensitizing school teachers on the impact of blue light on sleep health by the ISSR Faculty in April 2015, New Delhi

medicine. There are some universities who claim to have started sleep courses with diploma but have not come up with positive steps.

The initiatives of the National Academy of Medical Sciences (India)

National Academy of Medical Sciences (NAMS) is a pivotal medical organization in India which utilizes academic excellence in India to meet medical and social goals. The role of NAMS in bringing back the national focus on sleep medicine education is laudable. Under the leadership of JS Bajaj, Chairman, Academic Council, NAMS has taken some major initiatives in sleep medicine education in India [8, 9]. This decision is based on the documented evidence that the prevalence of sleep disorders in India is comparable to the rest of the world. As a pilot programme, it conducted a symposium on sleep medicine for medical students at All India Institute of Medical Sciences, Jodhpur. A pre- and post-assessment of the symposium showed the need for quality education in sleep medicine. A survey conducted by NAMS and AIIMS Jodhpur showed that sleep medicine practically does not find a place in medical curriculum in India. On the basis of these evidences, the Academic Council of NAMS identified sleep medicine as a critical area where it needs to initiate urgent steps.

Academic Council of NAMS recognized that health policy planning and implementation are the major tasks ahead of it. It also recognized that in the current scenario in India, the enormous burden due to communicable and non-communicable diseases leaves little resources with the government for additional undertaking. At the same time, there is acute lack of human resources for sleep health care in the country. There is an obvious link between the lack of human resources for sleep health care, and deficiency in medical curriculum. Strategies planned by NAMS include enhancing of educational activities at various levels, e.g. community, general practitioners, medical students and allied health professionals.

Projected strategies of NAMS are aimed at generating facilities, and creating awareness for sleep health care, with the support from governmental and non-governmental organizations. It would initiate training programmes for existing human resources for diagnosis and management of sleep disorders and associated co-morbidities. It would then use the generated physical and technological facilities to implement intervention strategies, and integrate sleep health care with existing primary health care system. It would provide upgraded facilities at the community health centres and sub-district (Taluka) hospitals. It would also initiate and develop tertiary care facilities at district hospitals and medical colleges.

Long-term objectives of sleep health care programme of NAMS envisage innovation of cost effective technologies and ensure a system of quality control. It would collate and disseminate information on sleep behaviour and sleep disorders especially in children, women and aged. There is a need for coordinating nationwide education and training programmes for the public, patients, as well as primary health care providers including community health workers. There is also a need for assessing the current and future needs of skilled human resources, drugs and devices. All these activities should promote self reliance in sleep health care in the country.

In summary, sleep health care should become a part of the medical curriculum and integrated national health services. Community-based primary health care schemes should be linked to specialized levels to ensure the quality of care. Sleep health care should take into consideration the requirements of the patient and the availability of resources. A group of experts should review alternative strategies, including practice of Yoga, and make specific proposals for planning of health systems. Planning and research on sleep health care must take into account the wide variations in social and economic conditions in the country.

Sleep curriculum in medical colleges: future directions

There are more than 409 medical colleges in India as per the list published by the Medical Council of India in 2014. This number does not include dental colleges. As mentioned earlier, a survey conducted by NAMS in 100 participant colleges showed that there is no structured sleep medicine module in any college except one. Even in this college the number of classes taken on sleep physiology and sleep disorders amounted to 2–3 h in 4 1/2 years curriculum. Thus, there is a total lack of topics on sleep medicine and chronobiology in graduate medical curriculum. We propose that there should be at least three lectures in physiology including circadian rhythm and 7–8 lectures in sleep medicine dealing with classification of sleep disorders, recognition and diagnosis strategy for narcolepsy, restless legs syndrome, insomnia, sleep apnoea, REM sleep behavioural disorders and impact of sleep deprivation. Standardized patient assessment and sleep diary should be a part of routine assessment. Sleep medicine can be best taught by vertical integration starting with basic knowledge to sleep disorders. This is the best strategy if we have to develop sleep medicine in the country. In other words there should be education at many levels in the field of sleep medicine.

Case conferences, grand rounds should be seen as opportunities to present the concept of sleep medicine to

subspecialties such as pulmonary and critical care medicine in which sleep disorders are part of the domain of practice. Residency in sleep medicine is a viable option in integrating sleep medicine. During 3 years of residency there will be ample opportunities to rotate in departments of physiology, neurology, psychiatry and pulmonary medicine which can be termed as horizontal integration. A change in mindset at leadership level is needed to develop the discipline of integrated sleep medicine.

National agenda for sleep medicine

Project ‘Sleep’ in the USA was a programme announced in 1979 by the surgeon generals’ office to focus the government programme on sleep research and sleep disorders [10]. Before that sleep education in US was a topic found in popular press and in psychiatric literature. The scenario in India in 2015 is no different from that of the USA in 1979. Although the USA has woken up to the call, the Indian government is still in delta sleep. A transition from deep sleep to paradoxical sleep may provide a chance for it to dream about a good sleep health care system in the country. Drowsy driving is yet to be recognized as a public health issue. Funding agencies have no specific agenda for sleep research. The plight of school children getting up early to catch the school bus is unnoticed. A number of physicians and technicians are interested in undergoing training in polysomnography. But not enough opportunities are available. The BA psychology curriculum has more chapters on sleep physiology, dream and circadian biology than in 1st year graduate medicine course. Although psychology text books address physiology of sleep and dream

to a good extent, these books generally do not have information about sleep disorders.

References

1. Dement WC, Vaughn C, editors. *The promise of sleep*. New York: A Dell Trade Paperback; 2000.
2. Kumar VM, Gulia KK. Sleep medicine in Ayurveda. *Sleep Med Rev*. 2015; doi:[10.1016/j.smrv.2015.02.006](https://doi.org/10.1016/j.smrv.2015.02.006).
3. Datta C. *Sushrut-Sanhitā (Sūtra Sthān) with Bhanumati commentary*. Edited by Vaidya Jadavaji Trikamaji Acharya and Pt. Nandkishore Sharma Bhashagacharya. Published by Pt. Shyam-sunder Sharma, Shri Swami Lakshmi Ram Trust Series No. I; 1939. p. 480.
4. Valiathan MS. *The legacy of Charaka*. Hyderabad: Universities Press (India Ltd), Orient Longman; 2003. p. 634. ISBN: 81-250-2505-7.
5. Panara K, Karra N, Goyal M. A review on the role of medicinal plants in the management of Anidra. *Int Ayurvedic Med J*. 2013;1:1–10.
6. Kumar VM. Ancient concept of sleep in India. In: Shiyi L, Inoue S, editors. *Sleep: ancient and modern*. Shanghai: The Shanghai Scientific and Technological Literature Publishing House; 1995. p. 25–33.
7. Kumar VM. Sleep medicine in ancient and traditional India. In: Chokroverty S, Billiard M, editors. *Sleep medicine*, Chap. 4. New York: Springer; 2015. doi:[10.1007/978-1-4939-2089-1_4](https://doi.org/10.1007/978-1-4939-2089-1_4).
8. Bajaj JS, Kumar VM. Sleep medicine in India: policy initiatives of National Academy of Medical Sciences (India). *Sleep Biol Rhythms*. 2014;12:258.
9. Kumar VM, Bajaj JS. Sleep Medicine Education in India: policy initiatives of National Academy of Medical Sciences (India). *Ann Natl Acad Med Sci (India)*. 2015;51:39–44.
10. Strohl KP. Sleep medicine training across the spectrum. *Chest*. 2011;139:1221–31.