CHAPTER 21

Sleep Medicine in Argentina

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Abstract: In this chapter we describe the history, research, education, and practice of sleep medicine in Argentina, pointing out the importance of the role of public policies in the development of sleep medicine grounds. With the drawbacks of a developing or "emerging" country, sleep medicine in Argentina has been growing up in the past decades. This fact allows us to be optimistic despite the unfavorable scenarios that our country usually goes through. Sleep medicine in Argentina is still rather young in the field of medicine and needs much more effort to consolidate as a specialty.

Keywords: Argentina, Accreditation, Demographics and practice, Health system, Research, Sleep medicine.

INTRODUCTION

Eighteen years ago, the first survey carried out by a group of Argentine researchers, explored the presence of sleep disturbances and the attitudes towards the problem that people who suffered in urban areas of Latin America (LA) (Mexico City, Buenos Aires, São Paulo). At present times, we can affirm that: in our country, around 20% of the general population sleeps little or badly, and this percentage goes up to 50% or more in groups considered at risk, in which the consequences of sleep deprivation will surely be manifested on the physical, mental and social health [1, 2]. At this point, in the twenty-first century, we must ask ourselves, which are the debts we have regarding sleep medicine in our country, and what are we doing to solve them? Among others, the occurrence of

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sleep alterations related to working conditions in the adult population, and the approach of sleep alterations in vulnerable populations stand out. In this chapter we describe the history, research, education, and practice of sleep medicine in Argentina, pointing out the importance of the role of public policies in the development of sleep medicine grounds.

A BRIEF STORY OF THE SLEEP MEDICINE

Although previously some researchers began to explore different aspects of sleep and its disorders, we could say that sleep medicine as we know worldwide emerged in Argentina in 1982, when the first laboratories began to work with professionals trained in sleep laboratories of the USA and European countries according, mostly, with standards of the Association of Sleep Disorders Centers (ASDC) and the Diagnostic Classification of Sleep and Arousal Disorders in 1979 [3].

More recently, in 1995, the Argentinean Sleep Society (AAS) was born, gathered by the interest of joint work for the knowledge of sleep and wake and its disorders. This was a product of the association of basic researchers in the field of sleep and chronobiology, neurologists, pneumologists, and pediatricians who worked at that moment in our country. The primary purposes of AAS included, among others, the following: 1) To gather all professionals whose activity is linked to the area of sleep and the sleep and wake cycle, normal or pathological, as well as to the diagnosis and treatment of related disorders, either at an experimental or healthcare level; 2) To encourage the exchange of scientific experience in this specialty, among their members as well as with other professionals, through congresses, periodic scientific meetings, dissemination, and edition of specialized scientific publications and; 3) To promote education and training in the field of sleep, being able to grant training certificates for the practice of the specialty; 4) To promote and enable the development of teaching centers, and different activities related to the field of research, diagnosis and treatment of normal and pathological sleep and those related to professional practice (Statutes of the Argentinean Sleep Society Civil Association, 1995).

In 1999, and contemporaneously, to the evolution of the American Sleep Association (ASDA) to the current American Academy of Sleep Medicine (AASM), the AAS was renamed the Argentine Association of Sleep Medicine (AAMS) in consonance with the emergency, -worldwide and in our country-, of sleep medicine as specialty/subspecialty.

ACCREDITATION SYSTEM OF PHYSICIANS ON SLEEP MEDICINE

In Latin América, the growth of sleep medicine has been important in recent decades. Good evidence for this is the growing number of member societies of the Latin American Federation of Sleep Societies (FLASS) [4]. Currently, there are members of the FLASS: The Mexican Society for Sleep Medicine and Research, the Uruguayan Sleep Association, the Chilean Sleep Medicine Society, the Peruvian Sleep Medicine Association, the Venezuelan Academy of Sleep Medicine, Sleep Medicine, Sleep of Panamá, the Brazilian Association of Sleep, the Ecuatorian Association of Sleep Medicine, the Argentine Association of Sleep Medicine, Sleep Medicine of Costa Rica and the Colombian Association of Sleep Medicine. FLASS is currently initiating a common certification system for Latin America. In 2018, according to FLASS rules, the AASM, initiated the process of accreditation taking into account three different instances: 1) A process of homologation of worthy sleep personalities in our country, 2) Regular Accreditation Process in Sleep Medicine and 3) an Extraordinary Accreditation Process in Sleep Medicine as a common path for the uniformity of our work at the national and regional level. Currently, instances number 2 and 3 are the formal procedures with which physicians are accredited in sleep medicine by the AAMS with the recognition of FLASS. Soon, we hope to be able to follow a similar procedure with members of different health areas related to sleep medicine, i.e. psychologists, dentists/orthodontics, and kinesiologists, with which, at least, with some of them, we have reciprocity agreements among societies that will facilitate joint work favoring to develop sleep medicine in all the areas involved.

EDUCATION

Analysis of LA training programs reveals that Brazil offers a sleep medicine residency and Mexico includes sleep training in the neurophysiology specialty and both countries offer sleep medicine certification. Sleep societies of Colombia and Argentina have developed their certification processes according to the FLASS guidelines [4]. Indeed, there are remarkable differences in sleep society consolidations, training programs, available certifications, terminology, regulatory entities, and requirements in LA. This is the main reason for considering great importance to standardize the training and accreditation system. We consider that the vehicle for achieving the purpose of having a common way of integration and application of sleep medicine in our continent is the FLASS and in the future, the World Sleep Society. Having said that, let us review the present situation of training in sleep medicine in our country. Currently, in Argentina, physicians interested in training in sleep medicine carry out their training in first-level centers, generally on a part-time schedule. They can take recognized courses of one year in sleep medicine and/or international postgraduate diplomas or master's

degrees in sleep medicine. According to AAMS/FLASS criteria, to be accredited in sleep medicine, a candidate must accredit at least two years in a recognized center in sleep medicine, attained by the accomplishment of a fellowship of one year or at least two years of part-time (2000 hours) activity. The candidate must also take a leveling course in sleep medicine accomplished by AAMS and accredit the background that makes him meritorious to pass an exam (written-multiple choice) in sleep medicine. The candidate must renew this accreditation every five years.

RESEARCH

Bernardo Houssay, Argentine scientist, Nobel Prize in medicine in 1944, an icon of the development of science and technology in Argentina, left great reflections on the subject. One of them is "Rich countries are rich because they dedicate money to scientific-technological development; poor countries continue to be so because they don't. Science is not expensive, expensive is ignorance". Even though Argentina is considered an emerging country or being realistic, a developing country, science and the academic level of science and medicine in Argentina have a great tradition: Argentina has three Nobel Awards in science (Dr. Houssay in Medicine, Dr. Leloir in Chemistry and Dr. Milstein in Medicine) and is the second country, behind Cuba, in the number of medical residents per 100,000 population. Despite the endless cyclical economic crises, the country has tried to maintain this legacy, with increasing difficulty to do so. A search for publications in indexed journals (PubMed search) shows a progressive increase in publications on sleep, probably due to the increase in interest in sleep on clinical grounds and the presentation of different classifications of sleep disorders (Fig. **1**). This increase parallels the growth in other countries of LA, Canada, and the USA, with the USA being in the first positions flowed by Canada, Brazil, Mexico, Argentina, and Chile. A great disparity in the number of papers separates the first three from the other three countries, probably reflecting differences between developed and underdeveloped countries, differences or rather deficiencies in public policies in spreading knowledge to the population, and low participation in public health policies for developing sleep medicine in countries of LA.

The Argentinean Health System

Argentina is considered a developing country with 44.2% of the total people living below the poverty line [5]. The Argentinean healthcare system is excessively fragmented, mainly into three major subsectors: the public subsector, the social security subsector, and the private subsector. Such fragmentation is evidenced by the many sources of funding, different coverage services, coinsurance, and copayments applied to different systems. (Fig. **2**).

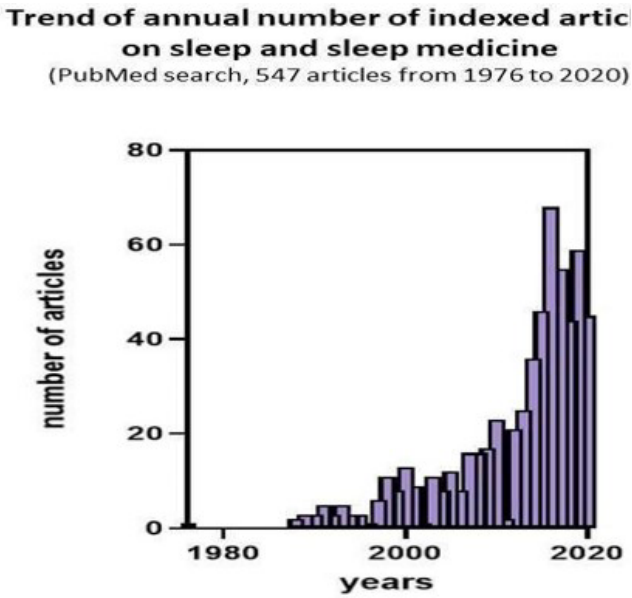

Fig. (1). The annual number of indexed articles on sleep and sleep medicine in Argentina from 1976 to 2020.

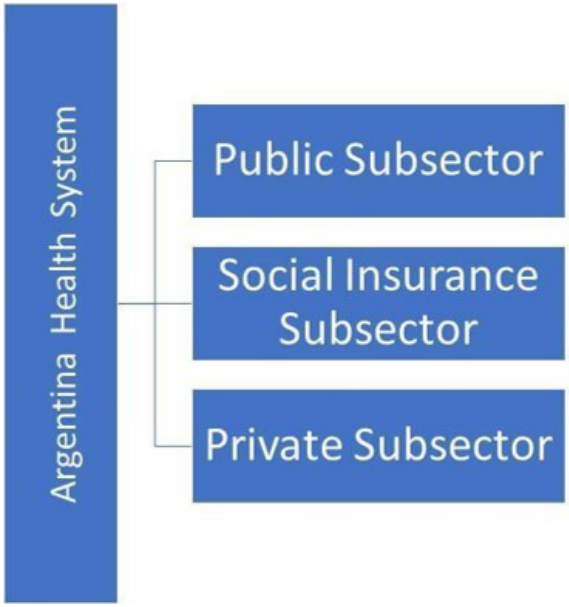

Fig. (2). Major Subsectors of the Argentinean Health System.

Fragmentation goes deeper inside each subsector: *the public subsector*, which is further fragmented at the country, province, and municipality levels, is subjected to the particular rules and regulations of the different jurisdictions. It is worth

stating that half of the total population of the country lacks any social coverage, and therefore, they depend solely on the public subsector; *the social security subsector* involves four erent scenarios: 1) 285 nationwide health insurance providers covering eleven million people, including in particular, Argentinean's National Institute of Social Services for Retirees and Pensioners (a.k.a *PAMI*, an acronym in Spanish which stands for "*Plan de Atención Médica Integral"*, meaning "Comprehensive Healthcare Plan"), covering about three million inhabitants, 2) Provincial health insurance providers (one per province and one for the district of the Autonomous City of Buenos Aires), covering about five million people, 3) health insurance providers of the Security and Armed Forces, covering about eight hundred thousand people and 4) health insurance providers depending on national universities, on the judiciary and on the legislative branch of government, covering about three hundred and twenty thousand beneficiaries; *the private subsector* [6] consists of several entities providing voluntary insurance services (prepaid medical care providers), which cover about two million eight hundred thousand people. Healthcare providers depending on trade unions, the *PAMI*, and provincial healthcare providers jointly cover about 22 million people, as per the statistics made available by the Argentinean's Superintendence of Health Services.

Based on the 2010 Census (latest data available), 36% of Argentinean people lack any kind of healthcare coverage or social security service (*PAMI* and healthcare providers depending on trade unions), and they are not able to pay for any private healthcare services. They receive medical attention at public healthcare centers and hospitals.

The percentage of people receiving medical attention at public healthcare centers and hospitals throughout the country masks enormous inequalities, because there are huge disparities among provinces [7]. While less than 30% of the people in Chubut, Tierra del Fuego, and the Autonomous City of Buenos Aires lack any health insurance coverage, in the provinces of Chaco, Formosa, and Santiago del Estero, more than 50% of the people lack any health insurance coverage.

Sleep Medicine Services in Hospitals

Patients suffering from sleep disorders usually resort to different hospital services, such as neurology, pulmonology, pediatrics, otorhinolaryngology, internal medicine, and psychology (in order of frequency). Higher-complexity medical visits, diagnostic tests, manual titration of positive airway pressure, and treatment adherence and follow-up are performed at the sleep units which are only located in some hospitals. Patients are directly referred by other specialists within the same hospital, or they are referred by other hospitals or public healthcare centers.

Some pulmonology and cardiology services assess patients using validated sleep questionnaires, respiratory polygraphy tests, and auto-adjusting CPAP titration at baseline. However, if there are either any doubts about any patient's diagnostics or adherence to treatment or difficulty to conduct treatment follow-up, the patient in question is referred to sleep medicine units. The professionals working at sleep disorder units have received at least basic training on sleep medicine to be able to conduct assessments employing validated questionnaires, perform respiratory polygraphy tests and draft the resulting reports, and conduct auto-adjusting CPAP titration to initiate the relevant treatment.

Sleep medicine units are staffed with physicians specialized in sleep medicine, neurologists and/or pulmonologists who apply their expertise to the care of children and adults, EEG technicians with experience in performing Polysomnography tests (PSG) and titration with positive airway pressure devices, nursing staff, and bioengineering staff for telemedicine information technology and technical support. Sleep medicine specialist units have a patient care program that includes referrals to neurology, pulmonology, cardiology, nutrition, otorhinolaryngology, psychology, psychiatry, pediatrics, adolescence, endocrinology, and bariatric surgery. The studies conducted at sleep medicine units in hospitals are pulse oximetry, respiratory polygraphy, 6-channel EEG polysomnography for respiratory tests, and 20-channel EEG to assess the brain electrical activity in neurological pathologies, multiple sleep latency tests, split-night PSG tests, manual and auto-adjusting titration of positive airway pressure systems, end-tidal CO_2 capnography, and transcutaneous pressure of CO_2.

Adherence and follow-up of the use of positive airway pressure devices are supervised in person or *via* telemonitoring through wireless connectivity. Non-invasive mechanical ventilation (NIMV) and CPAP training are also performed. Patients who need to use ventilation devices, such as CPAP or NIMV, undergo pressure titration and proper interface testing. The required devices are requested from the health funders, if available; otherwise, the devices are requested from the relevant health authorities through the hospital's social services department, and after the devices have been granted, patients start to be trained on CPAP or NIMV with their own devices. Any treatment, studies, and devices related to sleep disorders are provided by health funders, and if a patient lacks any health coverage, the local health authorities will at all times be responsible for such treatment.

Patient treatment and follow-up are usually performed at sleep medicine units to ensure treatment adherence, provided that patients are at the training stage on NIMV devices or that their sleep pathologies require a specialist permanently, because of the difficulties in dealing with such pathologies. Any other patients

showing good response to therapy and adapted to treatment are referred for follow-up to their primary care doctors, who will resort back to the sleep unit if there is any doubt.

Therefore, waiting lists for follow-up and personal appointments may be avoided because any questions may be answered by their primary care doctors, thus enabling access for first-time patients. Patients may currently make video calls with their doctors, thus avoiding waiting times in person-to-person appointments, loss of earnings, and board and lodging allowances in long-distance trips. These are some of the benefits of telemedicine with regard to sleep pathologies which are here to stay.

The sleep medicine units will be responsible for monitoring treatment compliance, maintaining the devices, restocking any disposable supplies, and replacing any necessary spare parts and interfaces of positive pressure devices. Such sleep medicine units will further any required proceedings before the health funders of patients or before the local health authority through the hospital's social services department.

Any patients who may need home mechanical ventilation will be assessed and adapted to ventilation upon startup, supervision of treatment adherence, and in-person follow-up by the sleep medicine unit in the event of hospitalization and *via* telemonitoring of home wireless connectivity. At some high-complexity hospitals with great demand for appointments, there are sleep medicine units for adults that also provide initial treatment of sleep disorders to pediatric patients, through physicians who have basic training on sleep disorders in children to provide outpatient care, report sleep studies, and initiate ventilation with positive pressure devices. However, if necessary, children may be referred to pediatric sleep units for a second opinion or to reassess the treatment effect. The care and monitoring of sleep disorder in adolescence and the transition to the adult hospital are particularly important and it needs to be properly instrumented.

Demography. The Argentinean Sleep Medicine Census of 2020

Last year we conducted with over 170 professionals the first census of professional or health workers in relation to the sleep health system in Argentina Members (82%) or nonmembers (18%) of the AAMS participated in this survey. We found that the dedication to different aspects of the sleep medicine activity was based on the following percentages from over 170 responses: clinicians 13.6%, cardiologists 0.6%, pulmonologists 34.3%, neurologists 37.9%, psychiatrists 3.6%, psychologists 1.2%, dentists 4.1%, respiratory physical therapist and sleep technicians 4.7%. 8.3% of the total reported worked with pediatrics, 60.1% with adults, and 31.5% with both pediatrics and adult patients.

The census reflects a growing field with multispecialty participation in sleep medicine. Regarding complexity for carried out studies, Level 1 in Institutions with three technicians by night involves 8% of the professionals, while Level 2 studies were performed by 33.8% and Level 3 and 4 conducted by 64.3% and 52.4% respectively. Another question we asked was the number of rooms they have to carry out level 1 studies. The results of this question were that less than half (48.5%) reported carrying out studies in 3 or more rooms (up to 5 rooms), 46% reported a study capacity of 1 to 2 beds, and 6.5% reported having more than 5 study beds per night.

Regarding the question about the amount of CPAP equipment they have in their laboratory, 38.4% have 1 or 2 CPAP equipment, 49.4% reported having auto CPAP equipment for titling in their laboratory; 28.7% with 3 to 5 CPAP equipment, 42.6% did not have BPAP equipment, 84% did not have servo-ventilation equipment at the time of the survey.

Regarding the follow-up of patients with sleep breathing disorders requiring the use of CPAP, 39.2% used telemedicine for the follow-up of these patients.

Sleep medicine in Argentina has reached enough complexity, a fact that was demonstrated during the COVID-19 pandemic by conducting teleconsultations, studies, and treatments with protocols prepared ad-hoc.

CONCLUSION

Although the field of sleep medicine in Argentina was rapidly progressing in the past decades, it is still rather young in the field of medicine and needs much more effort to consolidate as a specialty. All this development has had little support concerning public policies partly due to ignorance and partly related to the continuous, cyclical, economic crisis in our country. The society of sleep medicine in Argentina has the responsibility to discuss and take action for these issues. As William Dement [8] states: “There is an enormous amount of good yet to be done. Let’s do it!”.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Declared none.

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