Review Article

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Sleep problems: an emerging public health issue

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ABSTRACT

Sleep is one of the most significant yet neglected topic by health professionals as well as general public. Sleep has profound implications for physical, mental and psychological wellbeing of an individual. Modern socio-economic and lifestyle factors have resulted in sudden increase of the prevalence of sleep disorders over last few decades. Sleep disorders are resulting in significant economic losses for nations and are becoming a public health burden. High quality research studies have helped to better understand the determinants of sleep problems. Also the understanding of the nature and the control mechanisms of sleep have helped in devising screening, preventive and early-intervention modalities which need to be utilized widely by clinical and public health professionals. Advocating and educating about optimal sleep quantity, quality and sleep hygiene at occupational, institutional and various high risk group settings should be done by public health professionals through regulation on work hours, work shift patterns, and behaviour modification measures.

Keywords: Excessive daytime sleepiness, Health promotion, Sleep deprivation, Sleep hygiene, Sleep quality

INTRODUCTION

Sleep occupies nearly one third of human life. It is ubiquitous and found in all species in various forms. The timing, duration and pattern varies between different species and also with in. The pattern may be several intermittent episodes every hour to one single episode every day. Normally, adult human beings sleep seven to eight hours in one single episode at night whereas infants and elderly have frequent interruptions. In some cultures the pattern includes a mid-afternoon nap and a shortened night sleep. The normal variations in sleep appears to have evolved in tune with the light-dark cycles occurring due to Earth's revolutions around its own axis and around the Sun.

SLEEP AND CIRCADIAN RHYTHM

The molecular mechanisms of circadian rhythm (biological clock), involving pituitary-hypothalamic axis,

regulate sleep-wakefulness cycle and have a link with health and wellbeing. Increasingly, the importance of circadian rhythm on the health and wellbeing of human beings is being recognized which is evident by the fact that the Nobel Prize in Medicine/Physiology of 2017 was awarded to researchers for their discoveries on circadian rhythm mechanisms.²

The normal functioning of circadian rhythm depends on, among other things, the duration and pattern of exposure to light and darkness. A large number of studies have established the links between sleep and circadian rhythm.³ The health benefits of adequate sleep have been overwhelmingly documented. Sleep is necessary for optimal brain functioning, emotional wellbeing, physical health, optimal day time performance and safety. Sleep is also found to be associated with the metabolic rate, appetite and BMI.³

DETERMINANTS

Sleep disorders were traditionally known to be associated with organic brain illnesses and chronic diseases, where the molecular mechanisms involving circadian rhythm were deranged. Interestingly, a large number of research studies conducted in last few decades have shown that the factors related to behaviors, lifestyles and work also have a predominant role to play in sleep disturbances.⁴

In other words, reduction in sleep quality and quantity are often linked to many socio-economic and modern lifestyle factors such as long work hours, night shifts, rotating shift patterns, increased travel, fast and stressful life, mobile phones, computers, internet, video games, smoking, alcohol and drug abuse etc. ^{5,6} Further, a large number of research studies have established associations of sleep quality, quantity with sleep disorders. ⁷⁻⁹

PREVALENCE

Alarmingly, a sudden increase in the incidence and prevalence of sleep disorders has been documented by a large number of studies all over the world in just a few decades. The prevalence varies from 5-10% in general population to 40-80% in working population such as resident doctors, nurses, shift workers, business process outsourcing (BPO) employees and Information Technology professionals. Also, sleep disorders are documented in all age groups, societies and sections. ¹⁰⁻¹² In India, though studies on sleep are scarce, a few have documented a high prevalence among general population as well as specific population sub-groups. ^{8,9,13,14}

MEASURING SCALES

Studies on sleep at population level are aided by the development of valid and reliable scales such as Epworth Sleepiness Scale (ESS), Pittsburg Sleep Quality Index (PSQI), etc., which measure various dimensions of sleep problems. ESS measures excessive daytime sleepiness, an indicator of disturbances in sleep quantity and quality. Availability of such scales makes it easier for screening/detection of sleep problems in public health. ^{15,16}

HEATH EFFECTS

The health consequences of sleep disorders have also been documented by some long term follow-up studies. Abnormal sleep is found to have links with reduced life span, cardiovascular diseases, diabetes mellitus, prostate cancer, breast cancer, etc. International Agency for Research on Cancer (IARC) has classified sleep disturbing shift work as the 2A-Group (probable) carcinogen. Clearly, the increasing trend of sleep problems and their health linkages have made them assume a public health significance.

The short-term effects of sleep disorders on quality of life require as much, or slightly more, attention than the long term health morbidities and mortalities. Their well-known effect on cognition, performance, response time, mood, motivation, morale and initiative especially in younger adults, who are the economic backbone of a nation, results in significant economic losses. Some studies have estimated the costs associated with sleep disorders to be billions of dollars and a significant proportion of the country's GDP. The cost estimation studies consider not only the disease burden attributable to sleep disorders, such as myocardial infarction, stroke, diabetes, but also poor quality of life, performance errors, and the financial consequences of sleep-related accidents.

SLEEP HYGIENE

Recently, there has been an increased attention and interest in poor sleep-habits. Some factors related to behaviors and external environment which affect sleep are identified as sleep hygiene factors. Sleep hygiene may be described as practicing behaviors that facilitate sleep and avoiding behaviors that interfere with sleep. They are simple measures, which can be undertaken by most at no extra cost by few simple modifications in lifestyle. They are found to promote the optimal functioning and performance by ensuring good quality restorative sleep.²³

The sleep hygiene translates an understanding of the mechanisms of optimal sleep into practical advice about how to promote this through changes in lifestyle and the environment. Sleep hygiene is found to be useful in a wide range of sleep disorders. It includes advice about homeostatic, adaptive and circadian aspects of sleep control, how to avoid sleep deprivation, and how to respond to awakenings from sleep if these occur. Researchers have developed measuring scales for sleep hygiene. Sleep hygiene index (SHI) is one such valid and reliable scale. ²³

INTERVENTIONS

Many pharmacological interventions for sleep disorders such as sedatives, hypnotics and antidepressants are used by medical professionals. They are effective only to certain extent and associated with many undesirable, and sometimes serious, side effects including a propensity to cause addiction. Some investigation or treatment modalities like multiple sleep latency test (MSLT), Sleep Lab, continuous positive airway pressure systems (CPAP), some newer drugs and light therapy are very expensive. ^{21,24}

Research increasingly suggests that the non-pharmacological interventions are equally effective and are cheaper alternatives to address the problem especially in public health context. Moreover, there is plenty of scope for prevention. The cost effectiveness of preventive measures (sleep hygiene, screening, and early non-pharmacological intervention) appear to outweigh the curative measures (Sleep Lab, MSLT, drugs etc.). 25,26

CONCLUSION

It would be opt to say that from the public health perspective, it is about right time for sleep problems to get their due importance especially in countries like India. Advocacy for sleep quantity, quality and hygiene at occupational, institutional and various high-risk group settings through regulation on work hours, work shift patterns, behaviour modification measures (sleep hygiene), etc. should be an agenda for public health professionals.

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