Sleep hygiene at COVID-19 times to avoid circadian misalignment

Higiene do sono em tempos de COVID-19 para evitar desalinhamento circadiano

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ABSTRACT

In times of social isolation, as it may occur due to the COVID-19 pandemic, there are problems such as those regarding lack of regular exercising, socializing outside the home, all that can lead to poor sleep quality. According to the circadian rhythm, behavioral and physiological processes occur at the ideal times of the day and in the correct time order. However, circadian rhythms misalignment, as can result in confinement situations, can result in inadequate times for sleeping. All these constraints may result in metabolic and cognitive--behavioral negative consequences, at least. Consequently, healthy sleep hygiene indoors is necessary to avoid risk factors for insomnia and physical/psychological disorders. Besides, stress should be avoided by reducing exposure to a large amount of information on COVID-19 and its related negative consequences. This paper raises issues about the circadian rhythms and their ideal alignment, besides insomnia risk factors related to the disrupted environment and personal characteristics. In the end, some tips are presented regarding sleep hygiene at social isolation time.

Keywords: sleep, insomnia, social isolation, circadian rhythm.

RESUMO

Em tempos de isolamento social, como pode ocorrer devido à pandemia do COVID-19, existem problemas como os relacionados à falta de exercícios regulares, socialização fora de casa, tudo isso pode levar à má qualidade do sono. De acordo com o ritmo circadiano, os processos comportamentais e fisiológicos ocorrem nos horários ideais do dia e na ordem correta do tempo. No entanto, o desalinhamento dos ritmos circadianos, como pode resultar em situações de confinamento, pode resultar em tempos aberrantes para dormir. Todas essas restrições podem resultar em conseqüências negativas metabólicas e cognitivo-comportamentais, pelo menos. Consequentemente, é necessária uma higiene saudável do sono em ambientes fechados para evitar fatores de risco para insônia e distúrbios distúrbios físicos/psicológicos. Além disso, o estresse deve ser evitado, ao reduzir a exposição à grande quantidade de informações sobre o COVID-19 e suas conseqüências negativas relacionadas. Este artigo levanta questões sobre os ritmos circadianos e seu ideal alinhamento, além de fatores de risco para insônia relacionados ao ambiente perturbado e às características pessoais. Ao final, são apresentadas algumas dicas sobre higiene do sono no momento do isolamento social.

Palavras-chave: sono, insônia, isolamento social, ritmo circadiano.

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INTRODUCTION

Good sleep quality is essential for physical and mental health. This influences immune function, restoration of brain energy, brain glymphatic functions (for eliminating waste and facilitating the distribution of various compounds throughout the brain), reversing the degradation of performance induced during awakening, and also neuronal plasticity[4].

Consequently, concerning the highly contagious severe community infection of SARS-CoV-2, there is a need for social isolation, with implications for the health and economy of the population, which together can favor poor sleep quality.

However, poor sleep quality is common, even before this pandemic, but it can favor several risk factors for insomnia, even for those who do not usually have trouble sleeping.

Besides, frequent interruption of sleep can give rise to a vicious cycle of anxiety and insomnia, which can result in chronic insomnia (disruption of sleep at least three times a week for three months).

This particular period affects people in different ways, whether they are infected patients, first-rate health professionals, or also those kept indoors.

The purpose of this article is related to the main collective sleep problem of people in confinement.

SLEEP-WAKE CIRCADIAN RHYTHM DETERMINATIONS

The sleep-wake cycle (Figure 1) is linked to the circadian rhythm of the internal clock, repeated approximately every 24 hours[2,5,9]. A homeostatic and a circadian process regulate it. Besides, the most favorable sleep is usually expressed at night, and in the afternoon, after lunch, when there is a predisposition for a nap. However, these moments can be different if the person is naturally a night owl, or morning, lark, although they are more comically intermediate. This tendency is influenced by the genetic character itself, but also by environmental suggestions, called "zeitgebers" that can be photic, light stimuli (the number one zeitgeber), or non-photogenic external cues, which include feeding time, room temperature and exercise. Consequently, the endogenous rhythms are synchronized by external signals, like light and temperature, and feeding periods and the alignment of circadian rhythms in humans occur directly as a result of these zeitgebers.

There are also internal markers that vary throughout the day, such as cortisol and melatonin, which are highly responsive to circadian rhythms and, therefore, exhibit diurnal variation. However, "circadian misalignment" can occur between sleep-wake rhythms with the light-dark cycle. This lag is exacerbated by increased exposure to artificial lights, at night, or less light, during the day, as can happen during social isolation. As a result, there may be potentially harmful results to health due to these misalignments[2].

A specific problem with circadian rhythms concerns the influence of the interaction between hosts and hosted microorganisms. Consequently, virus infections can alter the biological processes of infected cells to favor their replication and dissemination to various tissues. Interestingly, recent studies are beginning to unveil aspects about the impact of infection on the biological clock and the possible disturbances that the virus can confer on it leading to its deregulation. This is reflected in circadian rhythm disorders, as shown in shift work, or social jet lag, when there is an increase in the incidence of various degenerative, inflammatory, metabolic, and neoplastic diseases[9].

It is known that the timing and alignment of circadian rhythms are essential for the health and well-being of all organisms, and the experimental literature suggests that misalignment increases the risk of cardiovascular disease, diabetes, obesity, and psychiatric conditions. However, more studies are needed to appreciate the mechanisms that contribute to the development of circadian misalignment, in addition to better characterizing its role in the treatment of chronic diseases[2].

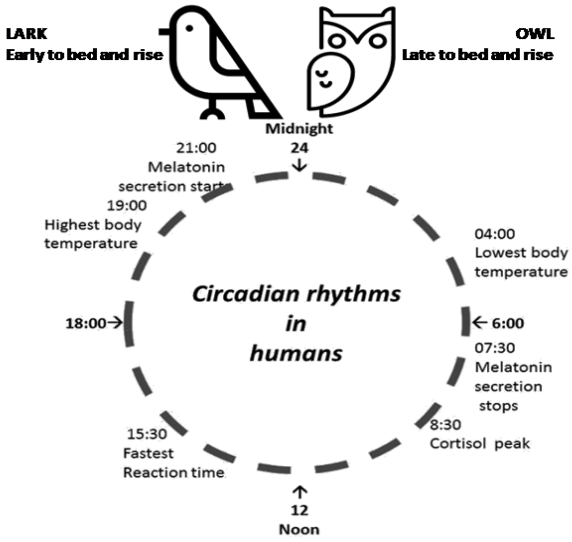

Figure 1. Circadian rhythms. The time of the day fits better with some activities. Maximum state of attention, better coordination, and faster reaction during the day; deep sleep / lower temperature at night. However, there is a difference regarding these moments, Larks to Owls, because for these, usually 2-3 hours later[5].

COLLECTIVE DISRUPTION AND RISK FACTORS FOR INSOMNIA

The COVID-19 pandemic has a sudden and massive impact on health infrastructure, transportation, daily activity, freedom of movement, and delivery of medical care[6]. This communal health problem is correlated with a collective trauma that destroys the basic structure of a society, besides the terrible life loss. This is a dramatic event that affects not only the direct victims but also the community as a whole. The COVID-19 pandemic problem itself brings other issues related to social detachment.

Returning to the shared health problem, this mass event can be generated by similar factors, as well as develop similar psychological and physiological responses for members of a society (Figure 2). Shochat[10] studies factors that potentiate the mechanisms involved in the development of sleep disorders related to the "zeitgeist" sociocultural, technological, and lifestyle of this era. Besides, sleep can become different while trying to reconcile the daily flood of news or dealing with difficult personal situations that can result in a minimum in disrupted sleep, unusual dreams, or nightmares.

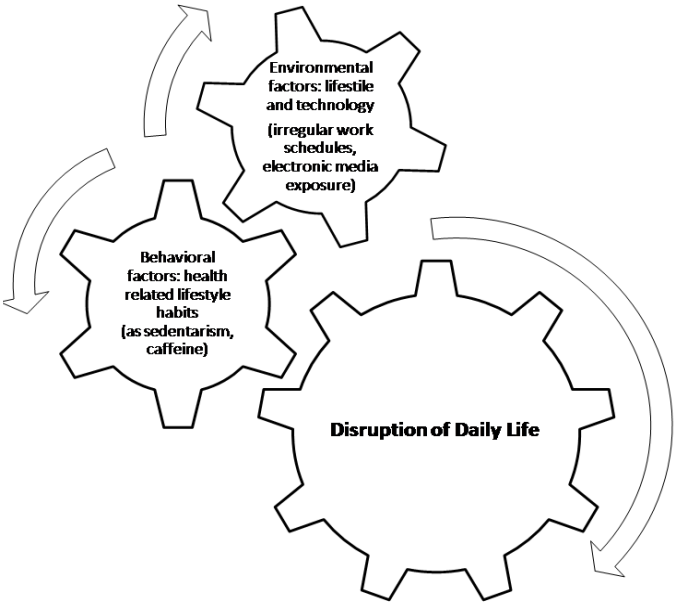

Figure 2. Factors that potentiate the mechanisms involved in the development of sleep disorders related to the "zeitgeist"[10].

There are people at higher risk of the harmful effects of confinement with repercussions on sleep, such as women who suffer more often from poor sleep quality than men, and those who live alone, and the elderly. The lack of regular social interaction can increase stress and negatively affect sleep quality, which is usually caused by depression and stress due to loneliness. However, for people who live alone, but do not feel alone, the quality of sleep may not be affected[1].

Also, this period can be particularly stressful for mothers or other caregivers who need to manage childcare, as well as domestic affairs and work[1].

However, despite the hard side of the confinement, there can be several positive effects that can improve the quality of sleep, especially in individuals who can still go out and are not under higher pressure linked to work or family[1].

Furthermore, sudden changes can significantly affect the mental health of psychiatric patients and reduce access to psychiatric services, but forthcoming research is essential to associate pro-inflammatory cytokines between psychiatric patients and healthy controls throughout the pandemic. Besides, health professionals may be exhausted. However, a recent study found that quarantine alone was not related to an increase in the prevalence of mental health harms in the general population[6].

In China, a web-based cross-sectional survey of 7,236 respondents assessed knowledge related to COVID-19, generalized anxiety disorder, depressive symptoms, and sleep quality. Young people reported a significantly higher prevalence of generalized anxiety disorder and depressive symptoms than the elderly. Also, people who spent a lot of time thinking about the outbreak and health professionals were at a higher risk of mental illness. Notably, the latter were more likely to have poor sleep quality[7].

In particular, insomnia has many risk factors for emerging it, as shown in **Figure** 3, one of which is related to stressful adverse events such as those occurring at the time of the COVID-19 pandemic.

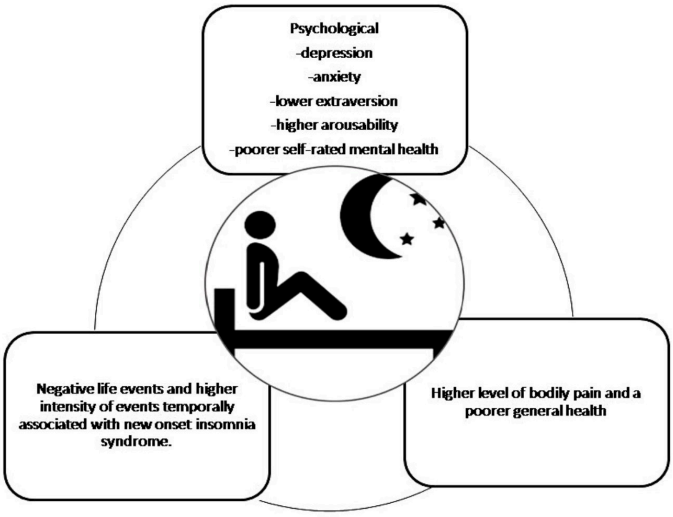

Figure 3. The most important risk factors associated with new-onset insomnia syndrome, according to LeBlanc[8]. Insomnia symptoms diverged from good sleepers concerning the number of adverse events suffered[8].

MEASURES TO BE ADOPTED AT SOCIAL ISOLATION TIME

A lesson to learn in social isolation due to COVID-19 comes from the experience of astronauts by the simulation carried out by the Institute for Bio-Medical Problems (IBMP) of the Russian Academy of Sciences (2011)[3]. It was recorded a simulated space mission confinement experienced. The researchers assessed how confinement and isolation would affect astronauts' performance, psychological well-being, and sleep, as they did not receive routine external cues ("zeitgebers").

This study shows that four of six of the crewmembers presented disrupted sleep-wake periodicity (*n*=1), augmented displacement of sleep into the diurnal period (*n*=2), performance deficits linked with chronic partial sleep deprivation (*n*=1), and common decreases in perceived sleep quality (*n*=2).

Thus, those who live isolated and confined need to follow a schedule, as the typical signs of daily rhythms are not so explicit. Likewise, there are tips for sleeping when an individual stays indoors during the isolation period. The main objective is to maintain the physiological and behavioral characteristics of the body according to the biological clock, even losing important external signals, as it happens at the time of social isolation. The main objective is the alignment of circadian rhythms, as already explained. Indoors, daily rhythm habits must be under control and scheduled.

Figure 4 summarizes many tips to be followed at the time of confinement. Besides, some other recommendations are presented regarding workers at COVID-19 times and special issues related to the use of benzodiazepines and hypnotic benzodiazepines (Boxes 1, 2). It is also essential to raise some problems related to women from families with young children to prevent them from being overwhelmed with family and / or work activities. Thus, it is crucial to ensure compliance with all tips on general rules on the sleep-wake cycle. Beneficial and enjoyable activities should also be promoted for children and parents (women) but avoid frequent use of computers, smartphones, and TV[1].

In summary, the first suggestions for promoting restful sleep during this confinement include: wake up at a regular time; go to sleep when on are sleepy; be aware of the effects of lighting; keep enough sleep; manage stress mainly by identifying irrational and negative thoughts. The use of relaxation techniques, such as stress reduction, inhibits cortisol release. These techniques include yoga, tai chi, mindfulness meditation, deep breathing exercises, and progressive muscle relaxation. It is time to remember that cognitive-behavioral therapy is a highly effective non-drug treatment for insomnia, and relaxation techniques are recommended in times of confinement.

If sleep hygiene and stress decrease exercises are not enough, neither cognitive behavioral therapy for insomnia, insomnia may exacerbate or precipitate other psychiatric disorders. In this case, psychiatric counseling may be necessary.

Thus, stress should initially be reduced by reducing anxiety and exposure to a large amount of information about news on COVID-19 and its related negative consequences. Also, it is crucial to monitor the symptoms of insomnia, more frequent among sleep disorders, first by reducing its risk factors, but administering them therapeutically if symptoms occur. Care should be taken not to develop signs of insomnia or excessive daytime sleepiness, maintaining the general sleep hygiene guide, and also trying to maintain sleep habits similar to normal conditions.

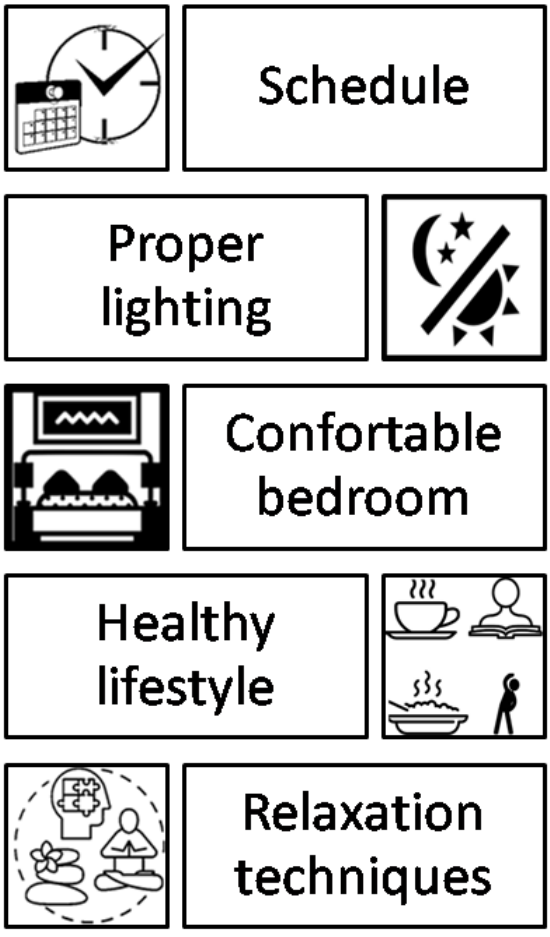

Figure 4. General measures about sleep hygiene at the social isolation time caused by the COVID-19 pandemic.

Box 1. Special measures for workers regarding sleep quality adapted from Practical recommendations from a task force of the European CBT-I Academy[1].

FOR THOSE WITH AN INCREASED WORK BURDEN AFFECTING SLEEP OPPORTUNITY

Plan brief interactions with people in close proximity to express stress and other emotions and concerns about the work situation.

In free time, keep tasks to distract, keep busy with family activities, and exercise regularly, but not before bedtime.

Limit exposure to news about the COVID-19 out-break as much as possible that is not directly related to personal work.

Try to get natural light during the day or bright lights at work, but not in the bedroom, where it must be dim.

Choose family and relaxing activities before bed.

Eat meals at certain times, but not immediately before the desired sleep begins.

If on experience symptoms related to lack of sleep or fatigue, including dangerous work-related error, inability to concentrate or make decisions, extreme irritability or strong emotional reactions, inform colleagues and superiors and take a nap.

When leaving a long working day, do not drive home in their car to avoid accidents.

Box 2. Sleep pharmacotherapy regarding sleep quality adapted from Practical recommendations from a task force of the European CBT-I Academy[1].

SLEEP MEDICATIONS

Avoid using sleeping pills as their effectiveness is questionable and they can have some side-effects if taken long-term.

The scientiÞc evidence of over-the-counter sleep medication is debated.

The main recommendations is cognitive Behavioral Therapy as the first-choice treatment for insomnia (CBT-I).

If CBT-I has been proven ineffective or is unavailable/unfeasible, short-term administration of benzodiazepine or hypnotic benzodiazepine receptor agonists might be effective.

Sedating antidepressants might be beneficial for short-term treatment of insomnia, mainly if the individual have a common co-morbid mental disorder.

In case of pharmacotherapy general treatment recommendations regarding dosage, durations and monitoring should be followed.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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