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SLEEP DYNAMICS IN ORDER TO DISCOVER THE TOPIC IN THE SOCIAL ENVIRONMENT

Jéssica de Moutta Gomes
Student of medicine course– Universidade Iguaçu (UNIG), Itaperuna-RJ, Brazil
http://lattes.cnpq.br/2293222853552044

Ana Luíza Moraes Oliveira
Student of medicine course– Universidade Iguaçu (UNIG), Itaperuna-RJ, Brazil
http://lattes.cnpq.br/5713134308334474

Drielly da Silva Rodrigues
Student of medicine course– Universidade Iguaçu (UNIG), Itaperuna-RJ, Brazil
http://lattes.cnpq.br/5722342811791518

Luizze Marini De Souza Espíndola
Student of medicine course– Universidade Iguaçu (UNIG), Itaperuna-RJ, Brazil
http://lattes.cnpq.br/2251841223424879

Abstract: In 2014, scientists at the Center for Applied Genomics discovered that people who slept around five hours a day had the Thatcher gene. This name refers to the former and famous Prime Minister of the United Kingdom, Margaret Thatcher, who was peculiar for having only four hours of sleep per night. Leaving this historical contextualization and entering contemporary reality, it is noted that words such as insomnia, physical fatigue, inattention and mental disorders are already present in the vocabulary of the Brazilian population when it comes to the topic of sleep. Due to the magnitude and impact that this issue has on the quality of life of the population, the following problem question was raised: "What are the ramifications of sleep and how does it impact the well-being of individuals?". This study aims to promote the reader's understanding of the constitution of sleep in the light of Neurophysiology and to make notes on important aspects surrounding sleep in order to clarify this topic within the social sphere. The present study was based on bibliographical review research in the literature relevant to the objectives. The bibliographic research included 30 scientific articles and periodicals, between 2005 and 2022, carried out in the following databases: Google Scholar, Scientific Electronic Library Online (Scielo), National Library of Medicine (PubMed) and Virtual Health Library (VHL). 25 articles were selected to compose the review article. It was found that sleep deprivation causes significant harm to daily activities, such as problems with selective attention and working memory, as well as problems often related to mental disorders, neurological illnesses and diagnoses in other medical specialties. Added to this, it emerged that the massive and excessive use of smartphones has had an impact on the quality of sleep, especially among young people. It is understood, therefore, that the majority of selected articles demonstrated that sleep quality impacts the balanced maintenance of the systemic functions of human metabolism, as well as brain functioning, and that dysfunctions linked to this physiological state affect the biopsychosocial well-being of individuals.
Keywords: sleep, Quality of life, De-obscure.

INTRODUCTION

In 2014, scientists at the Center for Applied Genomics discovered that people who slept around five hours a day had the Thatcher gene. This name refers to the former and famous Prime Minister of the United Kingdom, Margaret Thatcher, who was peculiar for having only four hours of sleep per night. This name refers to the famous Prime Minister of the United Kingdom, from 1979 to 1990, Margaret Thatcher, because she only had four hours of sleep per night (FORBES, 2020).

Leaving this historical contextualization and entering contemporary reality, it is noted that words such as insomnia, physical fatigue, inattention and mental disorders are already present in the vocabulary of the Brazilian population when it comes to the topic of sleep.

According to data collected by the Brazilian Sleep Association (2019), between 2018 and 2019, in a survey conducted nationally with the adult population participating in Sleep Week on Sleep Habits of the Population Participating in Sleep Week 2018 and 2019, it was possible to extract that the adult population is sleeping less, since in 2018 the hours of sleep corresponded to 6.6 hours per day, in 2019 this quantity fell to 6.4 hours per day. Added to this reduction, the research results are closely associated with the study population's knowledge of what quality sleep actually is, as well as its association with disorders linked to this unconscious state (ABS, 2019).

Due to the magnitude and impact that

this issue has on the quality of life of the population, the following problem question was raised: "What are the ramifications of sleep and how does it impact the well-being of individuals?".

This study aims to promote the reader's understanding of the constitution of sleep in the light of Neurophysiology and to make notes on important aspects surrounding sleep in order to clarify this topic within the social sphere.

METHODOLOGICAL DESIGN

The present study was based on bibliographical review research in the literature relevant to the objectives. The bibliographic research included 30 scientific articles and periodicals, between 2005 and 2022, carried out in the following databases: Google Scholar, Scientific Electronic Library Online (Scielo), National Library of Medicine (PubMed) and Virtual Health Library (VHL). 25 articles were selected to compose the review article.

RESULTS AND DISCUSSION

NEUROPHYSIOLOGY OF SLEEP

From a perspective of intertwining with Neurophysiology, it is observed that sleep is an active physiological state, natural as well as periodic in which the human brain is in full activity. This condition is also marked by changes in the condition of consciousness linked to reduced sensitivity to stimuli from the external environment, related to specific motor and postural characteristics, in addition to autonomous changes (AMERICAN ACADEMY OF SLEEP MEDICINE, 2005).

Sleep has an influence on brain functioning, as well as on the entire human metabolism, being essential in the renewal of conditions existing at the beginning of the previous wakefulness. With this information in mind, the core of this physiological state is the promotion of greater electrochemical discharges, compared to the waking state of the cells of the individual's nervous system, so that there is a correct performance and satisfactory human metabolism. During a night's sleep, all the person's physiological systems and roles undergo changes, in addition to each sleep circumstance, different responses occur from the body. (OLIVEIRA, 2016; WILIAM, 2005).

In relation to sleep phases, this unconscious state of active brain condition can be subdivided into two categories: REM (Rapid Eye Movement) sleep and NREM (Non-rapid Eye Movement) sleep. From the identification of specific EEG patterns linked to sleep, the following information was obtained: in REM sleep, individuals present rapid eye movements and in NREM sleep this peculiarity is not present. NREM sleep can be further divided into three distinct stages, that is, stages 1, 2 and 3, however, this last stage is commonly called "slow wave sleep" (HOSHINO, 2008; MIGNOT, 2008).

In the same line of reasoning, it is important to highlight that melatonin is the main hormone when it comes to sleep, as it signals the body when it is time to sleep and, therefore, about leaving the waking state. That hormone has high lipid solubility and is produced by the pineal gland of vertebrates from serotonin after tryptophan hydroxylation. In this panorama, it is observed that melatonin is released into the bloodstream only at dusk approximately two hours before the individual goes to sleep, reaching its highest point of secretion, that is, highest plasma levels, around the interval between three and four o'clock in the morning, happening a diversification due to the chronotype (CLAUSTRAT et al., 2005).

After its secretion, melatonin is distributed to numerous tissues in the body. Finally, it must be noted that this hormone is significantly influenced by light, which is the most relevant

factor in its hormonal regulation, both in relation to its synthesis and in relation to the circadian rhythm of its secretion. This rhythm appears in the suprachiasmatic nucleus of the hypothalamus that acts as an internal circadian oscillator, therefore, research reports that, when isolated from other structural parts of the brain, its neurons maintain the rhythm (CLAUSTRAT et al., 2005; ZEE AND MANTHENA, 2007).

THE SLEEP-IN QUESTION: HARMS OF SLEEP DEPRIVATION

Sleep deprivation is closely linked to several losses in an individual's quality of life, since essential biological processes occur during the rest period, such as cell repair, energy saving, hormone production and consolidation of long-term memory. Therefore, changes in sleep quality result in cognitive and occupational problems due to mental fatigue, which affects the individual's ability to maintain concentration, memory performance, the learning process and mood. As well, it causes metabolic dysfunctions, pro-oxidative and inflammatory reactions, conditions that become a risk factor for inflammatory and degenerative diseases of the nervous system (GUIMARÃES et al., 2018).

From the perspective of childhood and adolescence, sleep plays a crucial role in the physical, intellectual and emotional maturation of these individuals, being fundamental for the development of health and learning. During adolescence, there are notable changes in the sleep-wake pattern, such as delays in bedtime and wake-up time. These changes result in significant consequences, such as Excessive Daytime Sleepiness (EDS), characterized by the tendency to fall asleep during normal hours of daily activity, recognized as a global public health problem that harms academic performance by reducing attention, consolidation of memory and learning capacity. Studies indicate that the low quality of sleep, already identified in this age group, can be worsened by the use of electronic devices close to bedtime and irregular sleeping habits originating in adolescence can persist into adulthood (SOUZA et al., 2020).

The reduction in sleep quality and time during adult life corroborates adverse effects on human physiology and may be related to increased morbidity. Decreased sleep is directly linked to the development of metabolic disorders, such as diabetes mellitus and obesity. Individuals who sleep less than 7 hours a night tend to experience a drop in the production and release of hormones responsible for controlling satiety and hunger, that is, leptin and ghrelin.

The leptin hormone suffers a drop in its production, while the ghrelin hormone suffers an increase, which favors a decrease in satiety and an increase in the sensation of hunger, leading to an increase in the intake of more caloric foods and in larger portions, favoring excess weight gain. Added to this, the reduction in sleep hours generates a disproportionate increase in plasma glucose and insulin levels, causing a change in glucose metabolism, corroborating the increased risk of developing insulin resistance and type 2 diabetes mellitus (MENDONÇA et al., 2015).

Furthermore, although the mechanisms by which sleep deprivation interferes with cardiac and vascular effects are not explained, it has been proven that individuals who sleep less have a greater chance of developing cardiovascular conditions, such as high blood pressure, acute myocardial infarction and stroke, as this condition favors inflammation, oxidative stress and increased sympathetic activity. The immune system also suffers considerable consequences, as a reduction in sleep time leads to an increase in the release of the hormone cortisol, known as a stressor, which has relevant immunosuppressive

potential, favoring the risk of infections (DRAGER et al., 2018; PALMA et al., 2007).

SLEEP QUALITY AND THE SMARTPHONE EFFECT

The Smartphone has surpassed the computer and has become one of the main instruments for accessing the internet in recent times among the various contemporary mobile devices. Given this scenario, the young population is the one that stands out most when it comes to technology, since this social group in question is characterized by being connected to the internet for a long period of time during the day, using, above all, social networks, Therefore, within this age group, excessive cell phone use has already become a worldwide addiction (BRAZILIAN INTERNET STEERING COMMITTEE, 2018; DEREVENSKY et al., 2019).

Paying attention to this issue, the WHO declared that the excessive use of smartphones and other electronic devices is characterized as a global public health problem affecting several countries such as Turkey, thus demanding more research in order to obtain new scientific evidence surrounding of the factors that imply such addictive behavior, as well as the possible harm to users' health (ACIKGOZ et al.; WHO, 2014;).

From this perspective, it is noted that there is a controversial relationship between the use of smartphones and sleep. This is because the use of these devices before bedtime interferes with the regulation of melatonin, as these smartphones act as a modulator of this hormone. As previously mentioned, melatonin is secreted only at night, however, handling electronic devices at night causes the light emitted by the screens of these smartphones to modulate this hormone, as well as greatly interfering with the synchronization of the circadian rhythm, resulting in an inhibitory effect on the nocturnal production and secretion of melatonin, which leads to impaired sleep in individuals (SOUSA et al., 2020).

Nowadays, there are countless studies reporting a link between sleep quality and smartphone dependence. According to data from studies in Switzerland and Brazil, smartphone users, in addition to sleeping less during the week, also have sleep difficulties. Additionally, a study carried out in Indonesia showed that excessive use of these electronic devices at night can lead to sleep disturbances, contributing significantly to the manifestation of physical and mental disorders in these users, such as depression and anxiety. Therefore, it emerges from such studies that the current scenario is alarming and worrying regarding the impacts on sleep quality resulting from the massive and excessive use of smartphones, especially by young people (SCHWEIZER et al., 2017; CAUMON et al., 2020; DEWIR, 2018).

FINAL CONSIDERATIONS

It is understood, therefore, that the majority of selected articles demonstrated that sleep quality impacts the balanced maintenance of the systemic functions of human metabolism, as well as brain functioning, and that dysfunctions linked to this physiological state affect the biopsychosocial well-being of individuals, since the balance of the circadian cycle is essential for good performance and its interruption can have serious repercussions for the individual's general health.

In view of the above, it is also understood that, given the transformations in society and new lifestyles adopted, sleep hours have been neglected. In this context, the excessive use of smartphones is one of the habits originating from postmodernity that has greatly impacted the quality of sleep, as well as contributing to psychological disorders, as well as contributing to other dysfunctions

such as Excessive Daytime Sleepiness (EDS) and a greater risk of cardiovascular diseases.

In this line of thought, it is essential that important aspects surrounding sleep are widely disseminated to the population, bringing to light the real importance of sleep and the consequences that its poor quality can cause. Health professionals, in turn, could also during the anamnesis be aware of their patients' sleeping habits, as well as guide them regarding the importance of maintaining a quality night's sleep. This way, the theme of sleep dynamics would be obscured in the social environment.

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