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The Impact of Sleep Rhythm Disorders on Individual Mental Health

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Abstract:

Sleep Rhythm Disorders Are Among The Most Common Sleep Disorders Among People, And This Disorder May Arise As A Result Of The Complexities Of Life Demands That Lead To Psychological And Social Pressures, Thus Failing To Meet An Individual's Need For Sleep, Which In Turn Affects The Nervous System And Consequently The Whole Body. Therefore, Sleep Plays A Crucial Role In The Overall Health Of Individuals. This Study Aims To Understand The Impact Of Circadian Rhythm Disorders On The Mental And Physical Health Of Individuals, Using A Descriptive-Analytical Approach To Answer The Study Questions, Which Include: What Is The Concept Of Circadian Rhythm Disorder? What Are Its Types? What Is The Impact Of Circadian Rhythm Disorder On Individuals' Mental Health?

Keywords: Circadian Rhythm Disorders, Sleep Rhythm Disorder, Mental Health, Physical Health, Individuals.

Introduction:

God has blessed humanity with numerous gifts, among which is the indispensable physiological need of sleep. Abraham Maslow, incorporated physiological needs into the foundation of his hierarchy of human needs and motivations, recognizing their pivotal role in human existence. Sleep serves

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as a state of tranquility and rejuvenation, offering individuals a respite from the tribulations and rigors of life. It is characterized by a physiological condition wherein sensory-motor responsiveness to stimuli is suspended, signifying a cessation of sensory-motor interaction with the surrounding environment and a decreased attention to external stimuli (Al-Manwari, l, 2013).

Since the creation of humanity, individuals have been inherently programmed to work during the day and sleep at night, a pattern reinforced by their biological clock and hormonal activity, which peak during daylight hours. Consequently, their activities are typically conducted during the day, while they seek restful and deep sleep at night, especially after engaging in strenuous work. This sleep serves to alleviate the fatigue resulting from such exertion and rejuvenate their energy levels, preparing them to resume their tasks the following day (Haj Saeed, F, 2022).

Hence, all living organisms necessitate sleep, which is deemed the principal function of the brain, akin in importance to eating, drinking, and breathing, owing to its pivotal role in individual well-being. Medical professionals and specialists underscore the significance of sleep in upholding overall human health by augmenting cognitive capacities and facilitating optimal physical and mental performance, as well as protecting the body from tissue degradation resulting from daytime fatigue. Moreover, sleep contributes to maintaining the individual's biological balance and allows for the restoration of the brain's cortex, positively impacting the harmony between mind and body (Ouhida, S & Nashwa, M, 2023).

However, with the advancement of human life, it became possible for individuals to continue their daytime activities into the night hours since the discovery of the lamp. This progress tempts many people to extend their leisure or enjoyment time in the evening at the expense of their sleep. Television, phones, and all technological means, along with internet availability, have made it easy for individuals to fall into negative habits consciously or unconsciously, forsaking sleep for entertainment and staying awake until the early hours of the morning. This leads them to feel that they would miss out on important matters if they were to go to bed, thus impacting their individual lives. (Alexander, B, 1992)

Among the factors that also affect sleep is work or studying, as it exists in reality. For instance, individuals who work or study at night, during times when the body requires sleep, and then sleep during the hours when the body requires waking, disrupt the natural rhythm and pace of sleep. This leads to inconsistency and irregularity in sleep and wake times.

This is due to technological advancement, the industrial revolution, noise within cities, entertainment media, the abundance of satellite channels, and increased material consumption, which necessitates longer working and studying hours in order to secure a job after all these immense developments that have characterized contemporary life. Consequently, sleep disturbances have become necessary; individuals are besieged by everything that hinders the initiation or continuation of sleep. Many people suffer from sleep disorders, as indicated by numerous foreign survey studies, which suggest that sleep disturbances are prevalent among all age groups, including children, adults, and the elderly. These disturbances are linked to psychological and physiological conditions and are more prevalent among the elderly than males than females (Abdel Ghani, K, 2016).

In order for a person to live a life where they enjoy good health and have the ability to perform the daily requirements and burdens in a healthy manner, they must take care of their body and its vital organs and muscles. Within their body, God has entrusted them with what is known as the biological clock. This internal biological clock follows the individual's daily rhythm of day and night, wakefulness and sleep. Therefore, all functional variables coincide with the individual's daily rhythm, including the body's activity level, internal temperature, heart rate, blood pressure, and hormone concentrations. This means that it regulates all vital bodily functions and the secretion of various hormones from the endocrine glands (Rabaa, A., 2019).

Our understanding of the laws and mechanisms of the biological clock, and the role of rhythms in health and disease, will enable us to improve diagnostic methods, investigate causes, synchronize treatments with these rhythms, and potentially prevent many physical and psychological disorders associated with them (Zaatout, R & Hawam, S, 2018).

mong the most prevalent and marginalized sleep Disorders related to the biological clock is Circadian Rhythm Sleep-Wake Disorder (CRSWD). It represents a recurrent pattern of sleep interruption leading to excessive drowsiness or insomnia, resulting in a misalignment between an individual's sleep and wake schedules in relation to their external environment. (Peter, F, and all, 2016)

It is the body's ability to transition from sleep at certain hours, usually at night, to wakefulness and activity at other hours, typically during the daytime (Abdouni, A & Saed, S, 2010).

The sleep rhythm is among the most crucial rhythms contributing to regulating the sleep-wake cycle. It is the synchronization between the internal and external rhythms of the sleep-wake system. Any disruption in this rhythmic system leads to the emergence of various psychological and physiological problems that significantly affect individual well-being. Studies indicate that sleep deprivation, including circadian rhythm sleep-wake disorders, results in the appearance of psychological Disorders and

physical illnesses. Thus, this study aims to elucidate the extent of the impact of circadian rhythm sleep-wake disorders on the mental and physical health of individuals, starting from the following question:

What is the impact of circadian rhythm sleep-wake disorders on individuals' general health?

The Sub-questions:

-Definition and stages of sleep, along with its physiological aspects.

-Definition and classification of sleep disorders.

-Understanding the concept of circadian rhythm sleep-wake disorder.

-Identification and classification of different types of circadian rhythm sleep-wake disorder.

-Exploration of the effects of circadian rhythm sleep-wake disorder on the mental and physical health of individuals.

Importance of the Study:

-Shedding light on this disorder in order to attempt to develop strategies and proposals for its prevention or mitigation of its effects.

-Through previous studies, we have realized the importance of the impact of circadian rhythm sleep-wake disorder on individuals' psychological aspects.

-Understanding the extent to which regulating sleep rhythm contributes to enjoying mental health.

-The scarcity of studies that have addressed the topic of circadian rhythm sleep-wake disorder.

Study Objectives:

-Understanding the impact of circadian rhythm sleep-wake disorder on the mental and physical health of the individual.

-Understanding how to prevent circadian rhythm sleep-wake disorder.

-Identifying the mechanisms of sleep occurrence and understanding the physiology of sleep.

-Understanding the relationship between circadian rhythm sleep-wake disorder and organic disorders and the extent of its impact on them.

Reasons for Choosing the Topic:

- The researcher aspires for the study to serve as a starting point for therapeutic programs that help alleviate circadian rhythm sleep-wake disorder.
- The ambition to add a module of psychosocial circadian rhythms to the psychology curriculum.
- The topic falls within the field and interests of the researcher.
- The desire to support scientific research and researchers through the information presented in the research paper.

1. Concept of Sleep:

Al-Issawi defines it as "a physiological state characterized by relative calmness and cessation of sensory responsiveness to external stimuli as necessary."

As for Asaad and Kahla, it is "a vital functional process in the restoration of activity and maintenance of the necessary internal balance to supply the body and mind with the energy required to continue their daily functions (Dihya, M, 2020) .

Therefore, sleep is one of the vital functions as it is a state of rest and tranquility that the brain reaches after interrupting communication with external stimuli, thus serving as a means to renew activity in the human body and playing a role in maintaining the individual's mental and physical health.

2. Stages of the Sleep Cycle:

2.1. Non-Rapid Eye Movement (Non-REM) Stage: This is the stage during which sleep reaches slow-wave activity, such as alpha and beta waves in the brain, which are the slowest waves. This type of sleep constitutes the largest portion of the sleep period during the night, accounting for approximately 75% - 80% in adults. Some of its key physiological changes include:

- Decrease in arterial blood pressure.
- Reduction in heart rate.
- Peripheral vascular dilation.
- Occasionally increased gastrointestinal motility.

This type is divided into four stages:

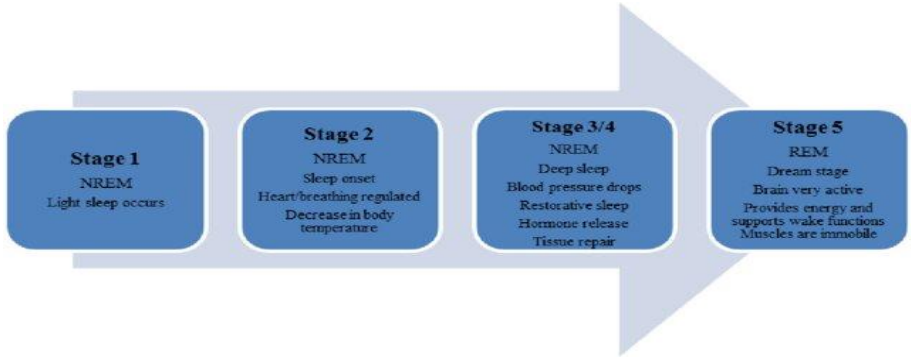
- **Stage One:** This is the stage of very light sleep, where the individual experiences relaxation, a slight decrease in heart rate, and a slight increase in breathing rate. This stage lasts for a few minutes, and the individual may awaken quickly during it.
- **Stage Two:** This is the second stage characterized by a decrease in heart rate and breathing, and the eyes become more still. All body processes slow down during this stage, which lasts only 10-15 minutes.
- **Stage Three:** In this stage, the body is even more relaxed, and the muscles are in a state of complete relaxation. There is a significant slowdown in heart rate, breathing, and physiological processes. Snoring occurs during this stage, and growth hormones are secreted while cortisol hormone decreases from the pituitary gland.
- **Stage Four:** This is a stage of deep sleep where heart rate and breathing decrease by 30% compared to waking. The sleeper is deeply relaxed and rarely moves, making it difficult to awaken. It is believed that the body replenishes its energy during this stage, and hormonal changes occur similar to stage three (Dihya, M, 2020).

2.2. Rapid Eye Movement (REM) Sleep:

This is a deep sleep stage constituting 25% of the human sleep cycle. It is characterized by a state of significant brain activity resembling wakefulness. Dreams occur during this stage, and individuals can remember them because they are stored in memory. Metabolism may increase by up to 20% during this period. Some of the key features of this sleep stage include:

- Active dreams occur, and individuals can recall these dreams.
- It may be difficult to awaken the sleeper, and spontaneous awakening may occur.
- muscle tone inhibition.
- Heart and breathing rhythms are often irregular.
- Increased brain metabolism.
- Relaxation of the lower jaw(El-Sherbiny, L, 2000).

Fig 1: Stages of the Sleep Cycle



2.3. sleep do we need:

- The amount of sleep needed varies with age: A newborn baby sleeps approximately 17-18 hours a day, spending about 50-70% of this time in the Rapid Eye Movement (REM) stage of active sleep. By the age of five, a child sleeps around 10-12 hours per day, with 20% of that time spent in REM sleep. (El-Sherbiny, L, 2000)
- An adult typically needs around 8 hours of sleep to function well during the day. However, the duration of sleep varies from person to person; some individuals may only need 5-7 hours, while others may find that 9 hours are not enough.. These differences in sleep duration depend on various factors. For instance, children and teenagers need more sleep than adults and the elderly, and women generally require slightly more sleep than men (El-Sherbiny, L, 2000).

- Through presenting these stages, the importance of sleep in each stage becomes clear, as every individual should reach them to ensure quality sleep and consequently good mental and physical health. The rapid eye movement (REM) stage is of paramount importance as it occupies the largest portion of nighttime sleep and contributes to entering a phase of relaxation and rest. It consists of four stages, each with its benefits in maintaining overall health and enhancing brain function. The second stage, the REM stage, is no less important than the preceding stage as it represents the deep sleep stage, reaching its peak, thereby stimulating the activity of various brain areas that promote both mental and physical well-being (Hamouda, S & Lagoun, L, 2020).

3. Sleep Physiology:

Studies indicate that the regulation of the sleep-wake cycle is carried out by the brainstem and cholinergic systems. Stimulation of the sympathetic nervous system leads to awakening from sleep through the intervention of various hormones and neurotransmitters such as corticotropin, cortisol or corticosterone, norepinephrine, and adrenaline, and hormones that are secreted from the hypothalamic-pituitary-adrenal (HPA) axis, which is considered one of the most important systems during sleep. Any stress on these glands, which are influenced by subcortical centers as they contribute to sleep regulation, can lead to sleep disturbances and insomnia.

One of the most important centers responsible for sleep in the brain, according to its function, are as follows:

Rapid Eye Movement (REM) Sleep Centers: These areas are located in the pons, and their positive activation leads to the occurrence of both non-rapid eye movement (NREM) sleep and REM sleep. Any dysfunction in these areas can result in the absence of REM sleep while maintaining NREM sleep.

Centers responsible for non-rapid eye movement ,sleep: Among the most important centers responsible for this stage is the pons, the medulla oblongata. Activation of these areas leads to the activation of the cerebral cortex, thus initiating the NREM sleep stage. Any disruption in these areas can lead to long-term sleep disorder.

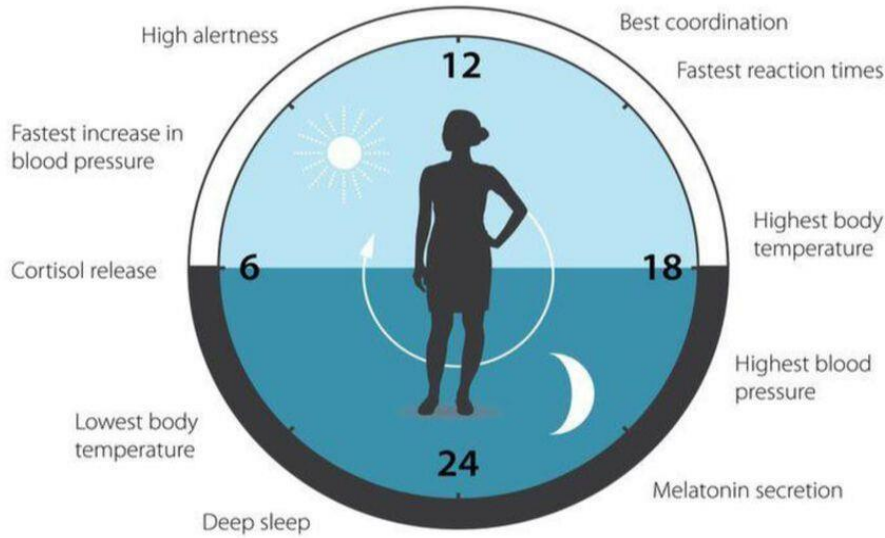
The sleep-wake cycle regulatory centers: The area responsible for the transition between sleep and wakefulness is located in the anterior part of the hypothalamus, beneath the thalamus, above the optic chiasm. It is responsible for regulating sleep-wake transitions during the light-dark cycle. Any dysfunction in this area leads to excessive

wakefulness (insomnia), resulting in fatigue, which poses a risk to the body (Al-Siddiqi, H & Al-Sharif, A, 2020).

3.1. the sleep cycle and circadian rhythm:

The regulation of the sleep-wake cycle in humans is governed by the circadian timing system, as illustrated in the following figure:

Fig2: The figure illustrates the natural cycle of the biological clock in the human body and provides an overview of the rhythm. It clarifies the functions that are crucially controlled by the human daily cardiac pacemaker. The time of day when the functions of the endocrine glands peak, including deep sleep, metabolic control, immune responses, and alertness, is indicated by the heart and blood vessels throughout the 24-hour cycle (Masri, s & Sassone-Corsi, p, 2018).



The "biological clock" is located in the suprachiasmatic nucleus in the brain above the optic chiasm at the base of the skull. It consists of thousands of nerve cells that help synchronize an individual's health with their daily activities, bodily functions, and mood. Serving as the control and coordination center for the individual's daily rhythm, it regulates the timetable and coordinates with other cells to ensure full activity during the day. The biological clock contributes to regulating

functions such as sleep, appetite, body temperature, hormone levels, blood pressure, reaction time, and daily performance, thereby playing a crucial role in mental, physical, and behavioral aspects.). The biological clock is influenced by light and darkness, and external factors affect its biological rhythm. The body undergoes certain biological rhythms that control the brain, hormones, and cells. The 24-hour cycle of sleep and wakefulness helps in cell renewal throughout the week for quality sleep. It is essential to sleep when the body temperature begins to drop. The timing varies depending on whether the individual wakes up early or late, but the body temperature typically starts to decrease around 11 p.m. However, if the individual delays bedtime, the temperature continues to decrease, making sleep more difficult and shorter. This can lead to a range of disturbances such as difficulty concentrating, overeating, irritability, visual disturbances, and hallucinations (Hafri, Z, 2022).

It is worth noting the importance of sleep as a physiological and psychological phenomenon for all age groups because it is associated with the integrity of the nervous system, which operates in constant harmony during waking periods. Its importance is not lessened during sleep periods, as it serves as a renewal and monitoring mechanism for the body's systems after a full day of exertion. Among the areas responsible for sleep in the nervous system are the hypothalamic region, which regulates physiological functions during sleep, the spinal cord responsible for regulating physical functions during sleep, and the glands responsible for secreting sleep hormones. Additionally, the biological clock plays a crucial role in regulating the sleep-wake cycle. The integrity of these areas acts as a preventive factor against psychological and physical disorders that may occur if damage occurs to these regions.

4. Sleep Disorder:

It refers to the inability to enter into sleep for long periods, difficulty in maintaining it, or returning to it, as well as waking up either late or early compared to usual times, i.e., feeling unrest during sleep accompanied by a sense of discomfort upon waking up, which is manifested in the form of disruptions in daily performance, excessive

fatigue, lack of concentration, and continuous feelings of anxiety due to the negative effects of sleep disorder (Lockley, S and all, 2012)

As defined by Al-Desouk sleep disorders involve abnormal conditions related to the sleep-wake cycle, such as difficulty in entering or maintaining sleep, or experiencing excessive sleepiness. These conditions result from physiological, neurological, or psychological factors leading to a decrease in sleep quantity and quality, thereby affecting our relationships and mental and physical health. They are divided into two categories: sleep-wake disorders and sleep-associated disorders. (Haj Saeed, F, 2022)

Another definition of sleep disorders: It is a condition characterized by irregularity and inconsistency in the duration and timing of sleep, which contradicts the natural state of sleep and indicates the failure to achieve sleep in the desired patterns. These disorders include: insomnia disorder (onset and maintenance), sleep-related breathing disorders, parasomnias, circadian rhythm sleep-wake disorders, hypersomnolence disorders, and sleep-related hyperhidrosis disorders (Bin Jakhdal,A, 2021)

Also known as a group of disorders resulting from recurrent total or partial sleep deprivation before or during nighttime sleep or during daytime naps. (Abdouni, A & Saed, S, 2010)

As mentioned earlier, sleep disorders are among the most prevalent psychological disorders. They represent an abnormal condition characterized by difficulty falling asleep, maintaining sleep, or experiencing total or partial deprivation. Long-term and recurrent deprivation significantly disrupts an individual's daily life. Among the most common sleep disorders is circadian rhythm disorder, the focus of our current study. Despite its importance in the emergence of various prevalent psychological and physical disorders, it has not received much attention in previous research.

5. Circadian Rhythm Disorder and Its Types:

A- Defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), circadian rhythm disorder refer to a recurring and persistent pattern of sleep disruption caused by changes or disturbances in the individual's internal daily rhythms and sleep-wake schedule, which conflict with their social, occupational, or environmental demands.

B- This disorder leads to excessive daytime sleepiness or insomnia, or both.

C- Circadian rhythm disorders result in impaired social, occupational, and other important areas of functioning (Al-Hammadi, A, 2013).

This disorder is divided into three categories:

1. **Shift Work Sleep Disorder:** This occurs due to changes in sleep time or work schedules at times different from the normal. Symptoms include stress, anxiety, and the use of stimulants to stay awake, which may lead to quitting work.
2. **Advanced or Delayed Sleep Phase Disorder:** This occurs at the beginning or end of sleep, where individuals either go to bed very early or wake up very late involuntarily. This pattern is often observed in individuals with flexible work schedules or students.
3. **Irregular Sleep-Wake Rhythm Disorder:** This pattern is characterized by random sleep and wake times, often seen in individuals who do not adhere to a specific sleep schedule, such as the elderly or bedridden patients. It results in feelings of fatigue, weakness, and decreased energy, leading to lack of concentration, increased accidents, and susceptibility to physical illness (Abdel Ghani, K, 2016).

Definition of Circadian Rhythm Sleep-Wake Disorders:

The daily timing system undergoes specific evolutionary changes in sleep and wake patterns. It may be influenced by behavioral factors such as social and school commitments. In a study on diurnal preferences, Carskadon and colleagues noted that the preference for "morningness" or "eveningness" is a behavioral construct related to the optimal time of day for wakefulness. It is subject to individual preferences and their own estimates of sleep and wake times. Circadian rhythm sleep-wake disorders occur when there is a disruption in the individual's self-sustaining circadian cycles of night and day.

Rhythm Disorders:

Daily rhythms are the body's internal clock, and rhythm disorders refer to a group of conditions that affect sleep timing. Individuals with these disorders cannot sleep and wake up normally, and they struggle to wake up at the required time for work or study. Rhythm sleep-wake disorders listed in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) include delayed sleep phase type, advanced sleep phase type, irregular sleep-wake type, non-24-hour sleep-wake type, and shift work type. A diagnosis of circadian

rhythm sleep-wake disorder is made only if it causes psychological distress or impairs personal, professional, or educational performance (uleadme, A, 2013).

Sleep Rhythm Disorder: It refers to the lack of alignment between sleep-wake rhythms (biological clock) and the light-dark cycle. This disorder leads to chronic sleep problems and daytime sleepiness, thereby hindering individual performance (Jabr, S, 2018).

Therefore, sleep rhythm disorder is a type of sleep disorder resulting from a discrepancy between an individual's biological clock and external daily rhythms. Consequently, it leads to either excessive sleep and daytime drowsiness or difficulties in initiating or maintaining sleep, thereby impairing the individual's daily performance. This may manifest as either irregular, constantly changing, advanced, or delayed sleep-wake patterns.

Prevalence Rate of Circadian Rhythm Disorder:

The prevalence rate of Delayed Sleep Phase Disorder (staying up late and waking up late) in the general population is approximately 0.17%, but it can be higher than 7% among teenagers. The estimated prevalence rate of Advanced Sleep Phase Disorder (going to bed early and waking up early) is about 1% in middle-aged adults and is more common in the elderly (Jabr, S, 2018).

6. Effects of Circadian Rhythm Disorder on Physical and Mental Health: Sleep affects individual functional performance and both physical and mental health through its duration, quality, and timing, as follows: Effects of Sleep Duration: Studies have shown that a lack of sleep for one or two weeks leads to decreased attention and memory, decreased insulin sensitivity and glucose tolerance, reduced immune response to vaccination, decreased mood, and makes individuals more susceptible to heart disease and stroke.

The Impact of Sleep Timing: Repeatedly altering sleep schedules, such as working at night and sleeping during the day, can lead individuals to be more susceptible to cancer. The World Health Organization has classified the alteration of sleep timing as a potential carcinogen, with types of cancer including breast cancer, uterine cancer, prostate cancer, colon cancer, and rectal cancer. Variations in the sleep-wake cycle and disruption of the circadian rhythm lead to disturbances in metabolic energy, resulting in negative effects on

glucose metabolism, regulation of the heart and blood vessels, attention deficits, and neurobehavioral, mood, and cognitive impairments.

The Impact of Sleep Quality: The quality of sleep has negative effects on health and individual job performance, increasing the risk of diabetes and heart diseases. (Anwar, A, 2019).

6.1. Psychological Effects: Studies indicate that disruptions in circadian rhythm lead to psychological problems, including:

6.1.1. Depression: Studies have shown that a decrease in serotonin hormone secretion leads to depression due to the interaction between circadian clock gene rhythms, which imposed a reciprocal relationship between the temporal pattern and genetic pattern and symptoms of its rhythm with depression. Finally, there is evidence of the relationship between the functionality of the biological clock and serotonin secretion as two proposed mechanisms for the occurrence of "circadian depression (Khalifa, S, 2021).

The studies also indicate a relationship between the disruption of melatonin secretion and the following disorders: seasonal depression, unipolar depression, bipolar depression, suicidal behavior, anorexia nervosa, panic disorder, schizophrenia, and obsessive-compulsive disorder (Wehr, T, 1982).

Recent studies suggest that disruptions in the sleep-wake cycle also affect self-assessment of mood, and evidence has shown that it leads to mood disturbance in unipolar and bipolar disorders, as well as sleep disorders in other major psychiatric conditions such as chronic schizophrenia, and a significant proportion of patients suffering from depression (McClung, C , 2013).

6.1.2. Mood Disorders:

The disruption of the body's biological clock increases the likelihood of mood disorders. A study involving ninety thousand individuals, published in The Lancet Psychiatry, found that disruptions in the body's biological clock are associated with depression and bipolar disorder. Researchers at the University of Glasgow in Scotland warned that this serves as a warning for societies that have become less aligned with these natural rhythms. Although the study did not investigate the use of mobile phones, Daniel Smith, one of the researchers at the University of Glasgow, stated that it is certain that some individuals who have difficulty sleeping may use social media at

night. Participants in the study were asked to wear monitoring devices for a week to assess the extent of their biological clock disruption. Those classified as highly active at night or inactive during the day were identified as having a disrupted biological clock. These individuals were found to be 6% to 10% more likely to experience mood disorders compared to those who were active during the day and inactive at night. The study also found higher rates of depression, bipolar disorder, feelings of loneliness, decreased happiness, and mood instability among individuals with a disrupted biological clock. (Nader Suwan, N, 2023).

Among the psychological effects of circadian rhythm disorder are ego disintegration, cognitive decline, behavioral disturbances, decreased work capacity, hallucinations and delusions, heightened arousal and anger, blurred vision, forgetfulness, and difficulty concentrating. Additionally, feelings of weariness, despair, helplessness, and negative beliefs about sleep increase along with expectations of disturbed sleep. Prolonged wakefulness, alertness, stress, and feelings of exhaustion are also reported. Some research has even indicated the emergence of quasi-psychotic symptoms in individuals deprived of sleep (Abdel Ghani, K, 2016).

Additionally, if circadian rhythms are irregular in the short term, this can lead to difficulty concentrating, excessive drowsiness, and an inability to function properly. Moreover, if sleep patterns are inconsistent and changes persist over the long term, mood disorders may develop, along with physical issues such as obesity, diabetes, and blood pressure problems (Batoul, N, 2024).

6.2. The Physical Effects on Health:

Among the physical effects of circadian rhythm disorder are the following:

Numerous studies examining the relationship between sleep and health have revealed clear and logical associations. Short sleep durations have been linked to increased risks of various serious diseases, including cardiovascular diseases, diabetes, and certain types of cancer. Furthermore, the findings of many studies confirm that individuals who neglect general health principles tend to stay up late and sleep for short periods. Those who lead sedentary lifestyles are

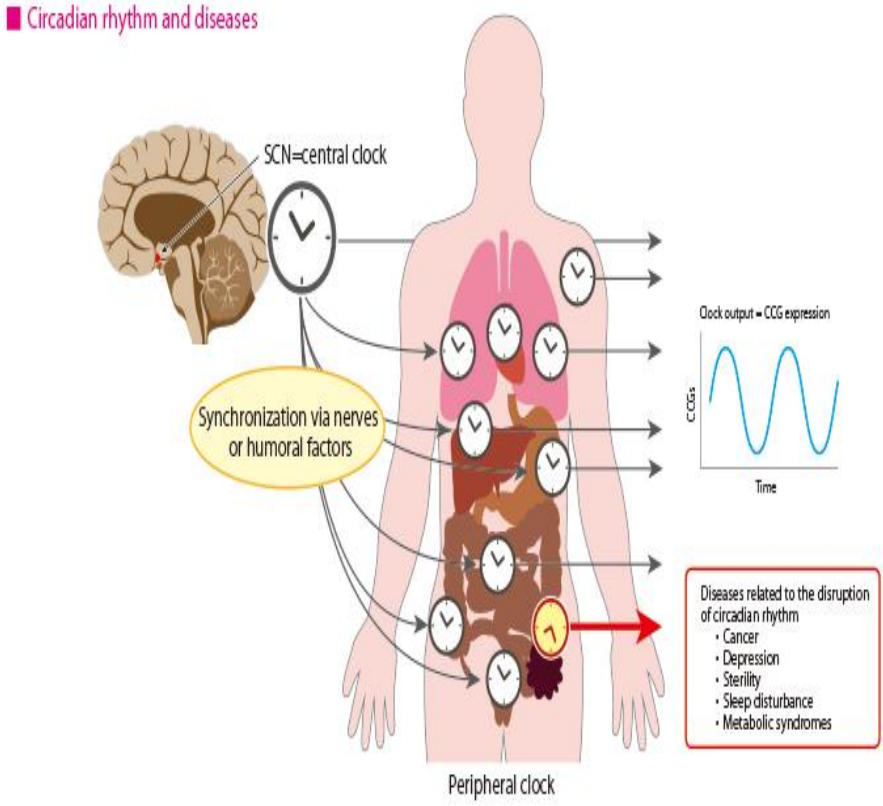
particularly susceptible to heart diseases and cancers (Ouhida, S & Nashwa, M, 2023).

6.2.1. Cancer:

Circadian rhythm disorder contributes to carcinogenesis and facilitates tumor formation in the human body, while conversely, the quality of sleep rhythms contributes to cancer prevention and treatment (Khalifa, S, 2021).

As concluded by prominent studies, it has been identified that disruptions in daily circadian rhythms contribute to the initiation or progression of cancer. This is because the biological clock regulates gene expression in body cells, contributing to various cellular processes such as nutrient metabolism, oxidative stress regulation, DNA and protein damage repair, and cellular secretion. The occurrence of circadian rhythm disorder disrupt these cellular processes and create a cellular environment conducive to tumor formation. Additionally, certain secreted factors such as cytokines and hormones, which are neurotransmitters, can send signals through their receptors to influence clock function. The functioning of the endocrine glands serves as vital indicators of the biological clock function in those tissues. However, some tumors can produce excessive amounts of these hormones or cytokines related to the biological clock, which can also disrupt clocks in distant organs (Khalifa, S, 2021).

Fig3: Circadian rhythm disorder



Reference Image:

https://ruo.mbl.co.jp/bio/product/circadian/images/circadian-rythm-and-disease-e.jpg

Specialized cancer researchers have linked cancer with darkness, finding that individuals who frequently stay up for prolonged periods are more susceptible to cancer due to their continuous exposure to light, thereby lacking the darkness that provides rest. They affirmed that the cells responsible for cancer are influenced by the day-night cycle, noting that these cells thrive and proliferate more rapidly during the day as they dislike darkness. American researchers Steven Hill and David Blask advise avoiding any natural or artificial light exposure in the sleeping environment, as exposure to light activates cancer cells in the brain. It is also recommended to avoid emitting any light from devices such as computers or other electronics in the sleeping area. Scientists connect darkness with the hormone melatonin, which the brain secretes when a person's eyes are in the dark. This hormone is responsible for inducing the desire to sleep and helps alleviate

insomnia. For those who stay awake or sleep in illuminated rooms, their brains are more vulnerable to the risks of cancer. (Abdel Ghani , K, 2014)

6.2.2. Sleep and Heart Diseases:

Individuals who sleep less than 6 hours are at increased risk of developing high blood pressure and heart diseases, with a higher likelihood of dying from heart attacks. Sleep deprivation affects the heart by inducing metabolic consequences that lead to an increase in blood fat levels, eventually escalating the risk of heart diseases over time. (Lockley, S and all, 2012)

In addition to the aforementioned, Circadian rhythm disorders lead to a variety of psychological and physical effects, including increased anxiety and stress, depression, mood disorders, impaired emotional control, decision-making problems, and weakened learning and memory. Moreover, they result in various physical effects, such as an increased risk of chronic diseases like diabetes, high blood pressure, and heart diseases, as well as immune problems like susceptibility to tumors. Circadian rhythm disorder may exacerbate existing disorders and illnesses, as recurrent sleep disturbances in general, and specifically problems with sleep rhythm, can lead to the emergence of chronic physical symptoms and diseases with a psychological origin. Most causes of sleep rhythm disturbances are psychological, as indicated by studies. It is noteworthy that sleep rhythm disturbances can cause psychosomatic mental and physical disorders, hence preventive measures against sleep rhythm disturbances should be taken by following a set of guidelines, including maintaining a regular sleep schedule, creating a comfortable sleep environment, avoiding caffeine, nicotine, and alcohol before bedtime, engaging in physical exercise, and regularly exposing oneself to sunlight.

Summary:

our study highlights the significance of addressing the psychophysiological aspect of sleep rhythm disorder, which govern most life activities and impact an individual's psychological and physical well-being. Circadian rhythm disorder encompass a range of disorders that disrupt natural sleep patterns, leading to various psychological and physical problems. These include heightened anxiety and stress, difficulty concentrating and thinking, decision-making challenges, learning and memory impairment, and increased risk of chronic diseases. This disorder presents both physical and psychological challenges, necessitating a deep understanding of its

causes and the implementation of preventive and therapeutic measures to enhance sleep quality and overall health. Individuals affected by sleep disturbances should seek professional help and adopt healthy habits to improve their daily lifestyle through preventive steps. You can aid in improving your sleep and enhancing your overall health.

General Conclusion:

Based on the information presented in the article, it can be concluded that there is a bidirectional relationship between sleep rhythm and the psychological and physical health of individuals. General sleep disorders and specific disorders in sleep rhythm adversely affect both the psychological and physical health of individuals. Additionally, an individual's psychological state impacts their sleep quality, which in turn negatively affects their physical health. Good sleep ensures good psychological and physical health, as the two are closely interconnected. For instance, stress resulting from sleep deprivation or sleep disorders can lead to physiological changes such as increased blood pressure, heart diseases, weakened immune system, and diabetes. Conversely, good physical health significantly influences mental health, as bodily discomfort, stress, or weakness can affect mood and overall psychological state, disrupting emotional balance. Therefore, attention to sleep duration, timing, quality, and type is crucial to ensure individuals' psychological and physical well-being. Overall psychological and physical health aids individuals in satisfying their basic needs, contributing to success and advancement in personal, professional, and academic realms, as well as achieving balance, stability, and positive life experiences. Therefore, individuals should prioritize caring for their sleep to attain good psychological and physical health, aiming for prosperity, well-being, and happiness in both personal and professional lives.

Suggestions:

1. Raising awareness among individuals about the seriousness of sleep rhythm disorders through awareness seminars.
2. Educating individuals about the importance of avoiding communication devices that contribute to sleep rhythm disruptions.
3. Establishing centers that provide services aimed at detecting sleep disorders and catering to individuals suffering from them.
4. Implementing educational programs on adopting healthy sleep patterns for all age groups.

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