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Physiology of sleep, interpretation of the unconscious

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Abstract. We spend about 37% of our lives in a dream, practically not a single night of our life can do without it, but in many ways it remains a complete mystery to us. The value of a dream is actualized by the fact that it performs the function of psychological protection for a person, analysis of information and its interchange between consciousness and subconsciousness.
In connection with the important role of a dream in a person's life, methods aimed at identifying how the psychological state of a person affects the processes of a dream, analyzing the concept of explaining the essence of dreams, the causes and mechanisms of occurrence and the relationship with the psychosomatic state of a person are acquiring special relevance.
Awareness of the dreaming experience and its semantic content can prevent the development of diseases, prevent the exacerbation of pathogenic processes in the body and increase the understanding of one's mental health.
Keywords: sleep, dreaming, psychological state, the sphere of the unconscious, psychology of dreams, archetypes, insomnia, pathogenesis, sleep phases, sleep disturbances, causes.

Sleep is an active psychophysiological process in which a person partially or completely loses consciousness and purposeful motor activity [1]
A dream plays an important role in the life of every person, since this phenomenon accompanies him throughout his entire existence. Human health is 90% dependent on sleep [5]. It is a fundamental biological process and has long been recognized as the most important factor in human health and performance.

Until the XIX century, there were mystical concepts associated with the interpretation of sleep. Gradually, a place was given to physiological and chemical interrelationships, and interpretations of sleep as a cause of a precursor to a morbid state appeared. The understanding of sleep as a state close to death prevailed in the minds of Europeans until the beginning of the XX century.

Scientists of that time P. Cabanis and I. Müller associated sleep with stagnation of blood in the brain, being adherents of the hemodynamic theory, and K. Bernard, A. Mosso and I. R. Tarkhanov, associated sleep disturbance with anemia [5,13]. The Czech anatomist J. Purkinje believed that sleep was caused by a rush of blood to the nerve centers, their swelling, as a result of which the fibers passing through them lose conductivity and communication with other parts of the brain. Even less plausible theories have been put forward [2,10,13].

Even earlier, records were written in Sanskrit on tree bark and palm leaves that have survived to this day, where a definition of two types of sleep is given - dreamless (deep) and with dreams, since ancient times in the East, in India and China, right up to the present time, sleep and dreams take pride of place. Even then, in Indian religious and philosophical treatises, dreams were considered as a separate form of consciousness [9]. This concept is close to modern classifications of sleep, distinguishing three functional states: wakefulness, slow and REM sleep.
Although not all sleep functions are fully understood so far, it is known to restore energy, promote healing, interact with the immune system, and affect both brain function and behavior [4].

Sleep stages. According to the EEG study, two types of sleep and its different stages have been identified. There is slow wave sleep (with alpha waves, theta waves and delta waves) and paradoxical sleep (with beta waves and rapid rhythmic eye movements) [4].
In slow-wave sleep, which is preceded by a period of falling asleep with alpha waves on the EEG, there are 4 stages:

— Stage 1. At the beginning of it, theta waves appear. This is a drowsy state with half-asleep dreams, hypnagogic mentism. May last up to 9 minutes;

— Stage 2. At this stage, sleep spindles appear on the EEG. Lasts 30 to 45 minutes;

— Stage 3. Lasts a few minutes, "sleepy spindles" disappear, giving way to slow-wave activity;

— Stage 4. The stage of deep, restorative sleep. Delta waves predominate. Lasts about 30 minutes. During this period, 80% of dreams, night terrors, sleepwalking, enuresis occur.

The sleep period consists of 5 cycles of 90 minutes. Each of them has a slow-wave sleep, and paradoxical, lasting up to 15-20 minutes. In the three subsequent cycles of slow wave sleep, there is no third and second stage.

Numerous studies state that dreams occur primarily during rapid eye movement (REM), a period of sleep that includes rapid brain activity similar to that which occurs during wakefulness. During REM sleep, dreams become more distinct, meaningful and emotional. The main functions of the REM sleep phase include processing information obtained in previous wakefulness and creating a program of behavior for the future. During REM sleep, brain cells are extremely active, but information from the senses does not come to them and is not supplied to the muscular system [3,4].
During the phase of slow sleep, the entire body is restored, and during the phase of rapid sleep, the nervous system itself. The periodization and reformatting of information also occurs in order to obtain the necessary experience for later life.

Sleep is a reaction of the intellect to events in life and a psychological and emotional state (internal feelings, troubles, secret desires) [6,11,12]. Normal physiological sleep determines the full functioning of the body during wakefulness. With insomnia, the amount of antibodies produced by leukocytes is significantly reduced, which leads to a decrease in the body's resistance to infections. Sleep and circadian rhythm have a powerful regulatory effect on the immune system. Studies of the normal sleep-wake cycle have shown that peaks in immune parameters such as T-lymphocyte counts and anti-inflammatory cytokine production occur during early night sleep, while peaks in circulating immune cells and anti-inflammatory cytokines occur during wakefulness.

The periods of wakefulness and sleep are directly related to the functioning of neurons in the brain. Thanks to research, it became known that the period of wakefulness is possible only with normal functioning of the cerebral cortex [14]. The work of neurons contributes to the maintenance of the state of tonic depolarization. In this state, wakefulness centers are formed. During the First World War, the Austrian neurologist K. von Economo, examining the brains of patients who died from infectious lethargic encephalitis, suggested that there is a "sleep center" and "wakefulness center" in the hypothalamus [1]. This assumption was confirmed in 1924 by the Swiss physiologist V.R. Hess in experiments on electrical stimulation of the thalamus and hypothalamus: stimulation of the thalamus with a weak current caused sleep in the cat, and with a stronger one - excitement. Hess's work on the functional organization of the diencephalon was awarded the Nobel Prize in 1949.

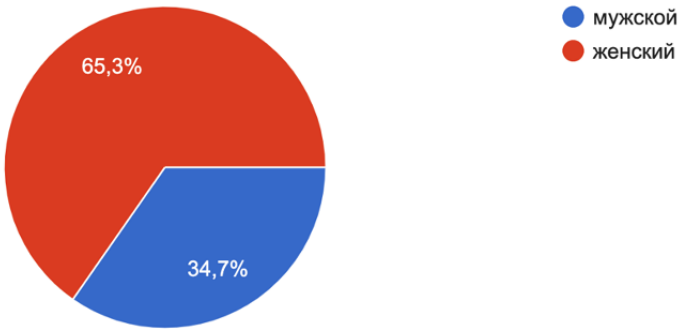
In physiological and mental diseases, sleep and dream functions are impaired [7]. As a rule, sleep pathology is one of the earliest and most persistent signs of a mental disorder, as well as a violation of autonomic regulation, general sensitivity, drives, activity. With diseases, there is usually an increase in the frequency of dreams, a change in their content and intensity. The appearance of unusually bright, scene-like and even colored dreams is often stated. Less often, there is a loss of dreams, uncharacteristic of their earlier fading. The content of dreams can be associated with painful experiences during the waking period. Sometimes in

dreams, the symptoms of the disease that have not yet been formed are reflected [8].

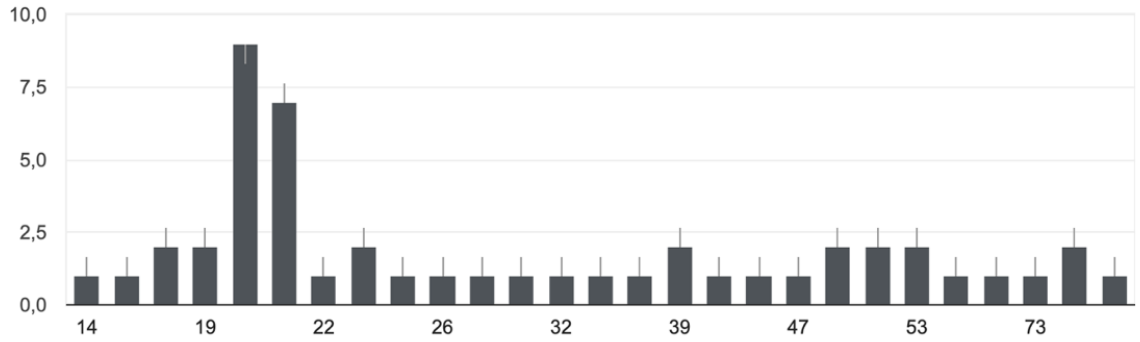
The purpose of our study was, on the basis of monitoring and analyzing the characteristics of dreams, to show the significance of the dreaming experience for the psychosomatic health of a person.
When performing this work from 2020 to 2021, at the first stage, a clinical and anamnestic examination was carried out on 70 practically healthy people of different sexes and ages 14+. The examination consisted of the traditional collection of anamnesis, questioning and interpretation of the result.
All participants in the survey were asked questions of the same sample about the state of health. They analyzed the data of the anamnesis (age, presence or absence of the disease, the likelihood of hereditary pathologies, the frequency of visits to the polyclinic).
At stage II, according to the results obtained during the survey, two groups were formed: a group with chronic diseases and a control group (people with an unburdened history).
The first and second groups were asked to comply with the recommendations set out in the annex.
The control group consisted of practically healthy people (52% of the respondents). With a state of complete physical, spiritual and social well-being, not registered at the clinic.

To study the patterns of sleep and human psychosomatic health, I created a psychological test based on the following methods:
1. "Questionnaire of the semantic content of dreams: theoretical foundations and an attempt to validate" Petrova V.A. and Tsvetkov A.The. 2017.
2. The book of Dr. Kasatkin V. N. "Theory of Dreams" 1983.
3. Sigmund Freud's book "The Interpretation of Dreams" 1899.

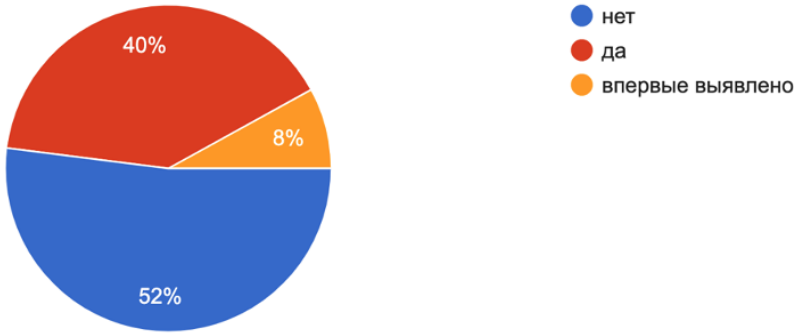
In the course of the obtained results of this question, 2 groups of healthy people and people with chronic diseases were formed for further research.



1 fig. "Gender of respondents"
The predominant number of participants was female, namely 65.3% of women and 34.7% of men.

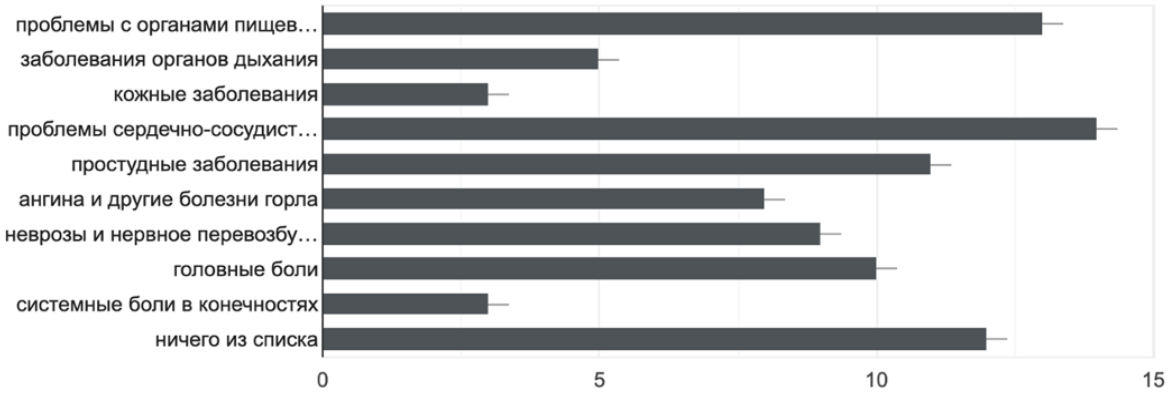


2 fig. "Age of



respondents"
3 fig. "Previously identified chronic diseases"

The first place among the respondents with chronic diseases according to the results of the study came out - diseases of the cardiovascular system, in second place are diseases associated with the digestive system, in third place - colds.



4 fig. "Types of Chronic Diseases"

In the first group, without identified chronic diseases, dreams are calm, without cases of nightmarish awakenings with a rapid heartbeat.
In the second group, with chronic diseases, the respondents had a high level of sleep anxiety. The presence of a feeling of fear, anxiety and unpleasant sensations at night does not leave 90% of those participating in the second group of the study. Also, several people were noted without identified chronic diseases, but with pronounced signs of anxious sleep, which require the recommendation of a

specialist, it was proposed to undergo a study by a specific specialist. In conditions where anonymity would be ruled out, the patient would be asked to undergo screening to detect or prevent the development of a chronic disease. It is the study of the nature of sleep in a particular person that takes place as an additional method for diagnosing a patient.
Thus, all the diagnostics carried out indicate the need to include methods that contribute to the identification of psychosomatic diseases in the health-saving medicine section in order to achieve a high level of diagnostics. This will make it possible to carry out medical diagnostics in full, to prevent diseases and their complications, thereby quickly reaching high rates in the standard of living.

It is supposed to continue the research in the future and prepare the respondents for the questionnaire in advance. The survey participants noted their interest in this type of diagnosis, noting the dependence of the flow and duration of sleep, the dreams themselves as a reflection of their psychosomatic health. From the beginning of the questionnaire, to the interpretation of the results and the assessment of the research results, we and the participants themselves noted the dependence of physiological and psychological health, the presence of chronic diseases on the quality of sleep and dreams. On the questionnaires themselves, assuming anonymity, the subjects provided their personal data for the purpose of further research and participation in the continuation of the survey and diagnostics.

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