

PHYSIOTHERAPEUTIC CORRECTION OF A PERSON'S PSYCHO-EMOTIONAL STATE

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Relevance of research. At the current stage of the development of society, it is the mental health of a person that is most and primarily exposed to negative influence. This is due to the acceleration of the pace of people's lives, the growth of the role of information in it, the need to constantly make a large number of complex decisions. As a result, situations arise in the life of every person, which are associated with the deterioration of his psycho-emotional state. There are two main approaches to its recovery: drug therapy and physical therapy.

Although drug therapy is considered the main treatment method, it has a number of side effects. In addition, there is a significant number of people who fundamentally refuse to take chemical preparations. Therefore, more and more attention is paid to alternative methods of treatment such as physiotherapy. With the development of physics and the appearance of electricity, artificial methods of physiotherapy began to develop rapidly, that is, those that allow hardware to reproduce physical factors used for therapeutic purposes.

Thus, the development of artificial physiotherapeutic methods and means to improve the psycho-emotional state of a person is relevant.

The purpose of the study. is to improve the operational characteristics of the device developed by us for correcting the psycho-emotional state of a person, which emits light streams of different colors and intensities.

Basic research materials. It is common knowledge that colors affect the human psyche to one degree or another, so all modern research is aimed at using this effect on the human brain in order to improve well-being. The work [1] presents the results of studies that prove that the use of a certain color effect contributes to a more positive mood of a person. It is also known that the microclimate in the room has a significant effect on the mood, health and working capacity of a person [2]. Using magnetoencephalography, scientists discovered the dynamic geometry of the neural representation of color [3]. They managed to find out that the brains of different people process colors in a similar way - and each shade of color causes different activation of the brain.

We developed a model of a device for correcting the psycho-emotional state of a person [4]. The basis of his work was the emission of light streams of various colors and intensities, as well as the creation of comfortable conditions for a person in a room (by changing the temperature and humidity of the air). The conducted experimental studies of the device confirmed that the emission of multi-colored light effects leads to a change in the α , β -rhythms of the brain, and therefore affects the psycho-emotional state of a person, an act of scientific research was obtained (the research was carried out in the KNP "Regional Clinical Psychiatric Hospital of the Kirovohrad Regional Council") [4]. However, this device had a drawback - the lack of ability to control the air conditioner and air humidifier at specified time intervals according to the specified work algorithm. Therefore, it was improved by adding a cyclic time relay to its circuit, which made it possible to control the air conditioner and humidifier [5]. As a result of these improvements, the device acquired a complex design (its principle of operation is based on the operation of two microcontrollers).

In fig. 1 presents a structural diagram of a modernized device for correcting (improving) the psycho-emotional state of a person, which does not have the indicated shortcomings. Its basis is one microcontroller unit (MCU), to which measuring transducers for air temperature (AT), relative air

humidity (AH) and atmospheric air pressure (AP), a receiver-transmitter module (RTM), an IR transmitter (IR) and matrix of ARGB LEDs (ARGB).

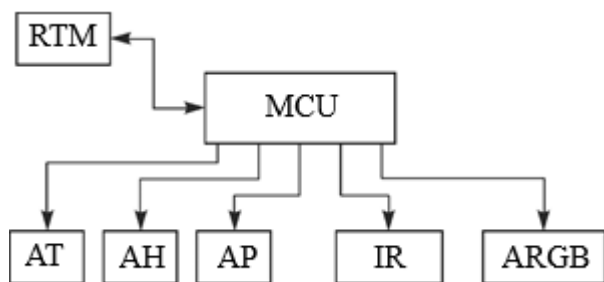


Figure 1 – Structural diagram of the device.

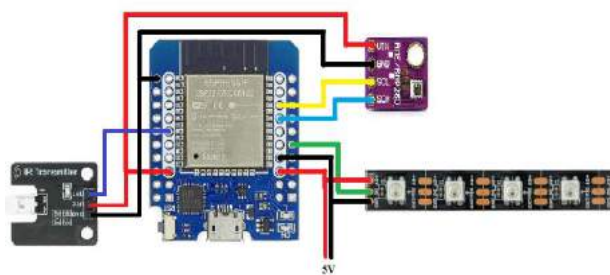


Figure 2 – Layout of the device control unit.

Based on the developed structural diagram, a model of the device control unit was made (Fig. 2). The working principle of the model of the modernized device is as follows. After turning on the device, it communicates with the user's mobile device via a radio channel. Next, the measurement transducers are polled and information about the state of the microclimate in the room is transmitted to the user's mobile device. With the help of a pre-installed application on a mobile device, the user selects the necessary scenario of visual effects and, in accordance with the doctor's recommendations, performs its settings (setting the type of light effects, their color, intensity, duration). Data on temperature and air humidity are processed by the device and, if necessary, it turns on the air conditioner and air humidifier by playing remote control commands. When the microclimate parameters in the room approach the corresponding preset values, the device sends a signal and, at the user's command, starts playing light effects according to a pre-selected scenario on the advice of a psychotherapist. After the end of the display of light effects, the device turns off the air conditioner and humidifier and goes into standby mode.

The peculiarity of the device is that it can be used not only for treatment. A number of "soft" scenarios of light effects are provided, which can be started every day, for example, in the morning, play certain light effects, which will help you wake up faster.

Therefore, the developed layout of the device has a simpler design and, at the same time, allows controlling household devices that create a microclimate in the room via the IR channel.

Conclusions. A mock-up of a modernized microcontroller device was developed for correcting (improving) the psycho-emotional state of a person by emitting multi-colored light streams, as well as maintaining optimal microclimatic conditions in the room, which generally lead to an improvement in the psycho-emotional state of a person. Clinical studies were conducted by recording the encephalogram of the brain when the device emits multi-colored light effects. A certificate of scientific research was obtained, which confirms the ability of the device to influence the psycho-emotional state of a person.

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