

The traditional concept of music therapy and resonance reflex theory  
acoustic impact

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Summary

The article is devoted to topical issues of music therapy - a relatively new direction for Russian health care, which nevertheless has a long history. The ancient Chinese concept of the influence of music and individual instruments on a person is considered from the standpoint of the theory of the five primary elements and wu-hsing. An overview of modern medico-biological and psychological research in this area is given, which made it possible for the first time to formulate and scientifically substantiate the fundamental resonance-reflex theory of acoustic influences.

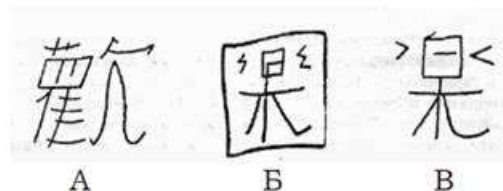
Key words: music therapy, instrument, pentatonic, psychoemotional, cells, inhibition, activation, auditory, vibrotactile, acupuncture-meridian, bioresonance.

Music therapy is a therapeutic and prophylactic direction that uses the art of music to correct, restore and maintain a person's psychosomatic health. This area includes more than 10 basic methods approved by the Ministry of Health of Russia [18].

However, the origins of modern music therapy go back centuries. The ancient Chinese civilization made a particularly significant contribution to the treasury of music therapy. Historical evidence confirms that in China, many centuries ago, music was used quite widely and in accordance with the rules of traditional medicine.

It is known that Chinese music is original and in many respects significantly differs from European. It has been an integral part of all life, a part of the philosophical, cosmological and religious picture of the world of the Chinese for several millennia, equally an impulse of the soul and a product of the mind.

In Confucian treatises emphasized socio-political, educational, the harmonizing role of music, its symbolic functions, connections with nature and man. An analysis of the ideograms of Chinese characters shows how much importance was attached to music in maintaining the psychophysical health of a person. In fig. 1 (A) shows the Chinese ideogram for joy. The hieroglyph for a percussion instrument consisting of stones suspended on a wooden stand is shown in Figure 1 (B). The Japanese ideogram for two players on either side of the big drum they are playing is shown in Fig. 1 (B). Players and drums are located on a wooden stand.



Rice. 1. Chinese and Japanese ideograms.

The ideogram of joy is also part of the ideograms denoting music and medicine. In the first case, the ideogram of joy complements the designation of sound, in the second, the ideogram of the plant.

This pictographic connection in ancient Chinese literature shows what effect music can have on a person - to bring joy and peace ...

The musical mode of Chinese music is called the pentatonic scale and is based on 5 tones. Table 1 gives the notes of the pentatonic range, the musical and symbolic functions of each of them, as well as the connection with

5 primary elements and vital organs in accordance with the concept of Wu Xing, one of the leading theoretical principles of traditional Chinese medicine.

The principles of five sounds are consistent with the five types of semantic intonation in Chinese, with the mysterious laws of nature, with the parts of the world and continents into which the earth is divided; with the fact that a person has five dense organs, and he has five senses. The pentatonic scale, thanks to such consistency with this law, is in harmony with nature.

In accordance with the same principles, the relationship of musical instruments and five primary elements is established (table 2). Another position of traditional Chinese medicine, reflecting the views of ancient doctors and philosophers on the reasons for the influence of music on the mental state is the relationship of vital organs with certain emotional states.

Table 1

Pentatonic notes (in comparison, function and affinity)

Название	1-й тон Kong	2-й тон Shang	3-й тон Yido	4-й тон Zhi	5-й тон Yu
Западна нота	До	Ре	Ми	Фа	Соль
Музыкальная функция	Тоника	Супер-тоника	Медианта	Доминанта	Супердоминанта
Символическая функция	Кайзер	Министр	Народ	Государственное дело	Естественный мир
Фаза	Земля	Металл	Дерево	Огонь	Вода
Орган	Селезенка	Легкие	Печень	Сердце	Почки

table 2

Correspondence of musical instruments to the five primary elements

Дерево	Огонь	Земля	Металл	Вода
Менее сложные				
Ксилофон, деревянные палочки, погремушка, кастаньеты	Штрайх-псалтырь, однострунные скрипка, альт, виолончель	Окарина (флейта), голос	Цимбалы, тамбурин, колокольчик, металлофон, виброфон, гонг, бубен, звонок, треугольник, тростниковый горн	Барабан: малый, стоячий, ручной, тамбурин, литавры, маракас
Более сложные				
Флейта, кларнет, гобой	Цитра, лира, гитара, скрипка, альт, виолончель, контрабас		Поперечная флейта, трембита, саксофон	

Thus, the liver, which in the concept of Wu Xing refers to the primary element "tree", is characterized by a key psychological function, which corresponds to emotion - anger. With hyperfunction (excess), there is observed: stubbornness, aggression, auto-aggression, fits of anger. With hypofunction (lack) - fearfulness, fear, depression. The heart has an affinity for the primary element "fire". Corresponding emotion - joy. In a harmonious state, the meridian provides an organizing principle, a striving for the new, for consonance with nature. Typical pathology: with excess - insomnia, insane impulses, with disadvantage - decreased ability to concentrate thoughts, incoherent speech, mental relaxation.

The spleen is correlated with the primary element "earth". Normal Function - Provides the ability to understand, memorize, analytical thinking, and imagination. Typical pathology: excess - obsessions, jealousy, limitation, anxiety about others, petty care; disadvantage - forgetfulness, memory loss, disorganization, excessive caution.

Lungs - have an affinity with the primary element "metal" - as an organ provide instinctive reactions, autonomous responses to aggression, intuition. Typical pathology: excess - irrationalism, obsessions; disadvantage - vulnerability, melancholy, loss of self-preservation instincts, interests, emptiness and hopelessness.

The kidneys belong to the primary element "water". Provide strength of character, conviction, peace of mind, sexual potency. Typical pathology: excess - authoritarian behavior, licentiousness, despair, sexual crimes; disadvantage - fear, lack of will, insecurity, mistrust, frigidity and sexual weakness.

Thus, traditional Chinese medicine has not only determined the closest relationship

between the psyche and internal organs, but also gave an instrument for psychophysiological regulation with the help of acupuncture, moxibustion and, in some cases, musical and acoustic influences. This does not contradict the modern concept that defines music therapy as a system of psychosomatic correction of human health using musical and acoustic influences [14].

When substantiating this concept, the experience of traditional Chinese and Indian medicine in the use of music for therapeutic purposes was taken into account, as well as the results of scientific works of the late 19th and early 20th centuries, modern authors and their own research were summarized [17]. THEM. Sechenov and I.M. Dogel noted the stimulating effect of marching music on muscle performance, which, in particular, revitalizes tired soldiers [6].

V.M. Bekhterev, who made a significant contribution to the study of the healing possibilities of music, noted that music, according to the doctor's decision, "... appropriately for breathing and blood circulation, eliminate oppressive fatigue and give members physical vigor "[2].

I.R. Tarkhanov showed by his original research that melodies that bring joy to a person slow down the pulse, increase the strength of heart contractions, promote vasodilation and normalize blood pressure, and irritating music has the exact opposite effect [9].

M.N. Livanov believed that the presentation of music can be likened to the presentation of a positive conditioned stimulus, which triggers a mechanism that synchronizes the rhythmic activity of various parts of the cerebral cortex [1]. In addition to the central nervous system, exposure to music affects the functions of other vital physiological systems: cardiorespiratory, muscular, and digestive.

There is no doubt about the influence of music on the function of the endocrine glands and the level of hormones in the blood, which play an extremely important role in emotional reactions of the entire spectrum. According to modern concepts, the formation of integral behavioral reactions of the body to various external stimuli, including music, is carried out using a complex functional system. And, in particular, on the basis of specific neurochemical mechanisms of the subcortex, which, due to chemical affinity, selectively mobilize the corresponding formations of the brain to perform one or another purposeful activity.

It has been shown that functional music has a lasting effect on the central nervous system. So, N.N. Zakharova and V.M. Avdeev investigated changes in the central nervous system during the perception of music by recording electroencephalograms in subjects with simultaneous recording of galvanic skin reactions. The findings indicated a change in the flux of excitation in the corticothalamic and corticolimbic circles. Deeper positive emotions for certain pieces of music were accompanied by EEG changes, indicating a high activity of the cerebral cortex [7].

THEM. Grineva found that listening to melodic music at a sports pace (quiet sounding) had a sedative effect on patients, and the EEG showed a decrease in the frequency spectrum of the alpha rhythm or a noticeable increase in its index, an increase in the amplitude of the alpha rhythm and a decrease in the amplitude of fast oscillations. Music is energetic, with a clear rhythm, contrasting, moderate tempo and volume, gave a tonic effect, which was accompanied by depression of the alpha rhythm, an increase in the amplitude and index of rapid oscillations [5].

Analysis of cerebral hemodynamics according to rheoencephalograms showed that in the overwhelming majority of cases, when listening to music, cerebral circulation was normalized.

With positive dynamics of mood V.S. Rusinov observed stable changes in the anterior regions of the brain in patients [8]. ON. Fudin et al. (1996), studying the influence of musical influences on the functional state of students before the exam and on the effectiveness of their performance of test operator activity, found that a certain way selected musical works improve well-being, reduce psycho-emotional stress, normalize autonomic tone and increase the efficiency of the subjects [10]. Our research has shown that receptive music therapy has a positive effect on the psychoemotional state of persons suffering from neurotic disorders. A group of 110 people of different sex and age, suffering from emotional lability and increased anxiety, was examined. A group of 67 people was assigned a course of receptive MT, which consisted of 10 sessions of 30 minutes each. in one day. 43 people who did not receive receptive MT were included in the control group. In the main

In the group, 74.1% showed positive dynamics, expressed by the repression of neurotic symptoms, a state of persistent psychoemotional comfort [19]. It was revealed that positive emotions caused by MT have a beneficial effect on certain somatic functions.

The effectiveness of the use of receptive musicopsychotherapy in somatic patients has been described in various clinical studies [2, 3, 18, 19].

The above data made it possible to understand the perception of music at the sensory level, carried out using the auditory analyzer. The psychophysiological reactions arising in this case, having an acousto-motor nature, which can be summarized in the form of the following provisions:

1. The sounds of music are perceived and undergo complex processing in the auditory analyzer, in particular, in the cortical structures of the brain.
2. On the nature of the perception of musical and therapeutic effects and the type of reactions occurring personal and objective, musical and dynamic factors influence. Personal experience includes life, movement, speech experience, musicality, psychophysical state and adequacy of the listener. Musical-dynamic factors include tempo, rhythm, tonality, loudness and timbre characteristics of the performed musical work.
3. With an adequate perception of the listener, energetic major, moderately loud music tones up physiological functions. Melodic, quiet, moderately slow, major and minor music has a sedative effect.
4. The resulting reactions of auditory adaptation give rise to certain associations, aesthetic experiences that actively affect the psycho-emotional state of a person.
5. Emotions, the dynamics of which always leads to certain hormonal and biochemical changes, indirectly begin to influence the intensity of metabolic processes, respiratory and cardiovascular systems, brain tone, blood circulation. Positive emotional arousal with the sound of pleasant melodies enhances attention, activates the central nervous system and stimulates intellectual activity.

However, later it was found that psychosomatic effects from exposure to music are caused not only by psychophysiological reactions, but also by direct acoustic-resonance responses from cells, organs and systems. So, in a number of experiments, a contact (passing hearing) acoustic effect was carried out on the control points of measurement of classical meridians, to which various orchestral pieces of music with a volume of 45 dB were broadcast through micro-headphones for 5 minutes. With the help of hardware measurements before and after the impacts, it was revealed that contact musical-acoustic broadcasting significantly affects the electrical conductivity of acupuncture points: in this case, major keys and a fast tempo of music, as a rule, increased the values of electrical conductivity, and minor keys at a slow pace reduced them [13].

In a subsequent series of studies, it was found that distant musical-acoustic influences in the form of listening to music-therapeutic programs change the state of acupuncture points. It has been determined that various musical timbres have a selective effect on organs and systems [11, 12, 13].

In experiments on the direct effect of music on cultures of melanoma cells, reactions of activation and inhibition of growth were revealed, depending on the type of exposure. Similar results were obtained when working with a culture of staphylococci and *Escherichia coli* [14, 15, 16].

It has been determined that direct effects of music on the blood of hypertensive patients cause a corrective effect on the blood coagulation system, in particular, on the prothrombin index [20].

The accumulated data turned out to be enough to substantiate the reflex-resonance theory of music therapy, in accordance with which the emerging therapeutic and health-improving effects of music therapy are due to four main components:

1) auditory, triggering psychoemotional reactions with the help of acoustic-motor reflexes;

2) vibrotactile, activating analgesic activity through vibroreceptors (bodies Paccini) at frequencies of acoustic influences up to 200 Hz;

3) acupuncture-meridian, regulating the activity of organs and systems;

4) bioresonance, directly affecting the activity of organs and cells. Thus, in

The reflex-resonance theory took into account both the experience of traditional medicine and the results of modern research, including the most recent data. A similar synthesis of Eastern and Western approaches in

medical science and practice gives not only a more holistic idea of the complex processes of musical and acoustic influences on a person, but also creates a serious basis for systematic research that will allow the creation of medical and health-improving technologies of the future and effective ways of managing vital processes.

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