UNIVERSAL ALGORITHM FOR GROUP MUSICAL PSYCHOTHERAPY

Abstract. The effective treatment of any disease depends very much on the patient's psychological state, so the control means of his emotional health will always be an important part of the complex treatment. Musical psychotherapy has a wide variety of tools for directed influence on the creation, manifestation and perception of emotions. The idea of using music therapy as an effective and inexpensive tool for creating an emotional background favorable for recovery in patients in hospitals and outpatient clinics seems to be very promising. The article reflects an attempt to create a universal algorithm for group music therapy for use in medical and diagnostic institutions in order to create a favorable emotional background there. To achieve the goal, an analysis of scientific research devoted to the study of the mechanisms of the influence of background music on the physical, psychological and emotional state of a person was carried out. The studies were analyzed, the results of which were published in the last 5 years in the scientific bases of Scopus, WebOfScience and PubMed. The analysis showed that background music is successfully used to purposefully influence the emotional state of visitors to supermarkets, restaurants, cinemas. There is some experience of using background music in educational institutions in Europe and the USA. Background music has not yet been used in healthcare, but a large number of new studies show that this practice can improve the effectiveness of treatment and rehabilitation, as well as the quality of life of patients with a wide variety of diseases. A necessary condition for the organization of effective group music therapy is the creation of differentiated music libraries, i.e. sets of audio recordings of musical works that have
certain emotional effects. In the EU and the USA, a certified music therapist can easily handle this task. In Ukraine, where such specialists are not trained, the staff psychologist of a medical institution will need the help of a specialist with a musical education. Depending on the melody, tonality, metro rhythm, tempo, harmony, texture, timbre, dynamics, pitch and other characteristics, a piece of music can tone or slow down the nervous system. Such effects can enhance the effect of painkillers, sedatives and anxiolytics.

**Keywords:** music therapy, background music, psychotherapy, psychology

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**УНІВЕРСАЛЬНИЙ АЛГОРИТМ ГРУППОВОЇ МУЗИЧНОЇ ПСИХОТЕРАПІЇ**

**Анотація.** Ефективність лікування будь-якого захворювання дуже залежить від психологічного стану пацієнта, тому засоби контролю його емоційного стану завжди будуть важливою частиною лікувального процесу. Музична психотерапія має безліч різноманітних інструментів для спрямованого впливу створення, прояви і сприйняття емоцій. Ідея застосування музичної терапії як ефективного та недорогого засобу для створення у пацієнтів у стаціонарах та амбулаторіях сприятливого для одужання емоційного фону уявляється досить перспективною. Стаття відображає спробу створення універсального алгоритму групової музичної терапії для використання в лікувально-діагностичних установах з метою створення сприятливого емоційного фону. Для досягнення мети було проведено аналіз наукових досліджень, присвячених вивченню механізмів впливу фонової музики на фізичний, психологічний та емоційний стан людини. Аналізувалися дослідження, результати яких були видані протягом останніх 5 років у журналах, зареєстрованих в наукометричних базах Scopus, WebOfScience and PubMed. Аналіз показав, що фонова музика успішно використовується для цілеспрямованого впливу на емоційний стан відвідувачів супермаркетів, ресторанів, кінотеатрів. Є певний досвід застосування фонової музики у навчальних закладах у Європі та США. У охороні здоров’я фонова музика поки застосування не знайшла, але велика
кількість нових досліджень показує, що така практика може підвищити ефективність лікування та реабілітації, а також якість життя хворих із різними захворюваннями. Необхідною умовою для організації ефективної груповий музичної терапії є створення диференційованих фонотек, тобто наборів аудіозаписів музичних творів, які мають певні емоційні ефекти. У ЄС та США з таким завданням легко впрацюється сертифікований музичний терapeut. В Україні, де таких фахівців не готують, штатному психологу лікувального закладу знадобиться допомога фахівця з музичною освітою. Залежно від мелодії, ладотональності, метроритму, темпу, гармонії, фактури, тембру, динаміки, звуковисотності та інших характеристик, музичний твір може тонізувати або пригальмовувати нервову систему. Такі ефекти дозволяють посилюти дію знеболювальних, сеативних та анксіолітичних препаратів.

Ключові слова: музикальна терапія, фонова музика, психотерапія, психологія

Introduction. The fact that music has a powerful influence on the emotional state of a person was known even to the ancients. Since the time of Pythagoras, an active study of the possibilities of using music for treatment has begun, which has never been interrupted, and with the advent of neurophysiological research methods, it has significantly intensified. By the middle of the 20th century, a vast experience in the use of music as psychotherapy had been accumulated; this created the conditions for separating music therapy (MT) into an independent specialty. The American Association for Music Therapy has been operating since 1981 and currently has over 10,000 members [8], the European Music Therapy Confederation has been operating since 1989 and has more than 7,000 specialists from 30 countries [7]. In Ukraine, specialists are not trained, so MT is used only by certain private medical centers and some psychotherapists.

The purpose of the article: to develop a universal algorithm for group music therapy (based on the use of background music), which could be used in outpatient and inpatient medical and diagnostic institutions in order to create a favorable emotional background. In order to achieve this goal, an analysis was made of the scientific publications of the last 5 years on the use of the group music therapy (as background music) in healthcare settings. Search for literature was conducted in the scientific bases of Scopus, WebOfScience and PubMed, 98 publications relevant to the subject under study were identified, 40 of these were directly used in the review).

The impact of music on the psychological state of a person. The urgency of the problem is obvious: a completely accessible opportunity to improve the efficiency of work in healthcare is not used. This disregard for the possibilities of music is especially contrasting against the background of its very successful and scientifically substantiated use in trade, advertising, and sports. In everyday life, we see dozens of examples of the effective use of music every day. Music accelerates the movement of buyers in the trading floors during peak hours and makes them
linger at the goods at the rest of the time [14]. Music increases the effectiveness of training not only for elite athletes, but also for ordinary gym visitors [34]. Even the taste of food and wine largely depends on the background music, which is well known to restaurateurs [5, 23]. Music increases the physical productivity of workers and helps knowledge workers to concentrate on their tasks [39]. In melodramas, background music creates a lyrical mood, while in thrillers it keeps the viewer in suspense [22]. There is no doubt that the widespread use of the positive impact of music in the health care system on a national scale would bring enormous economic benefits by reducing the loss of temporary disability. It’s not even about the indicators – it’s enough that you can improve the mood of patients and employees, reduce emotional stress and conflict. At the moment, neither Europeans nor Americans can boast of a wide practical use of music in health care and education. Scientific studies of the possibility of using MT in intensive care, oncology, neonatology departments have begun to appear in large numbers in recent years [9, 25]. The first successful steps in the practical application of background music in schools have already been made [4].

Acquaintance with the scientific literature on MT shows a wide variety of methods used. In addition to the emotional impact that interests us, music can have various effects due to the direct impact of acoustic waves on the nervous system and internal organs of a person, which have biorhythms of a certain frequency range. The degree of coincidence of these frequencies with the frequencies of sound vibrations of music determines the severity and direction of such influence. This is how the effects of resonance, antiresonance or incomplete resonance arise. Separate MT methods are based on the physical properties of music, which are combined into a group of somatic music therapy [28]. These include the method of binaural synchronization of the hemispheres of the brain by Robert Monroe "Hemisync" [1] and A. Tomatis high-frequency sound method, called "auditory therapy" [17]. All these techniques are used individually and are not intended to correct the emotional state of a person, which makes them unsuitable for our purposes. Since we are exploring the possibility of creating a positive emotional background in the rooms where patients spend time: in physiotherapy rooms, in hospital wards or while waiting for a doctor's appointment, our choice is based on the method of passive group music therapy.

The goal set before us is technically quite achievable: many hospitals and polyclinics already have audio systems. The researchers recommend using classical music, which is completely heterogeneous. It is unlikely that pregnant women in the perinatal department will relax and feel peace when listening to "Ride of the Valkyries" from the opera by Richard Wagner or "O Fortuna" from “Carmine Burana” by Carl Orff. Such sad music as the Prelude in E Minor by Frederic Chopin would hardly be appropriate in the intensive care unit, and visitors to outpatient clinics will not be delighted with Johann Sebastian Bach’ Toccata in D Minor. Acquaintance with the scientific literature on this issue confirmed our fears. The
monograph “Bad vibrations: the history of the idea of music as a cause of disease” published in 2016 under the editorship of Professor Kennaway J. is devoted to the mechanisms of the negative impact of different types of music on the human body. The book contains chapters devoted not only to pop music, but also to classical music. In particular, a detailed description of the negative impact of Richard Wagner's music on the human psyche is given. The title of the chapter "Wagnerism as a disease of civilization" speaks for itself [16]. Of course, far from all Wagner's music has negative properties, but it is a vivid example of the ambiguity of the impact of classical music on the psycho-emotional state of a person. However, with all the diversity of classical music, researchers are unanimous in recognizing the positive influence of Mozart's music on the psychophysiological state of a person. F. Rauscher and G. Shaw discovered in 1993 a short-term improvement in cognitive function in subjects after listening to Mozart's sonata for two pianos in D major (KV 448) was called the "Mozart effect" and gave a powerful impetus to the study of the neurophysiological effects of classical music [30].

In recent years, the term “Mozart effect” has been given a broader meaning, since many studies have found a positive effect of Mozart's music on the energy expenditure of newborns, and such an effect could not be found in the music of other composers [38]. The influence of Mozart's music on the functional state of the fetus and the body of pregnant women was also positive [10]. Several dozen studies have shown that Mozart's Music significantly reduces the number of epileptic seizures in 84% of patients [29]. However, it turned out that Mozart wrote a total of 626 works in his short life: 68 spiritual works, 23 works for the theater, 22 sonatas for harpsichord, 45 sonatas and variations for violin and harpsichord, 32 string quartets, about 50 symphonies, 55 concertos [15]. Each of these works has its own characteristic features; most of them consist of many parts. Is all Mozart's music useful? Which works are suitable for post-infarction patients and which for hypertensive patients? After all, would the melancholy "Lacrimosa" from his Requiem fit anyone? An analysis of survey and experimental works on MT showed that most often the exact name of musical works is not indicated. In many review articles, the music of Mozart, Beethoven, Vivaldi, Grieg, Schumann and Tchaikovsky is presented as homogeneous in its properties. In original studies, the music used is often described as "excerpts from Mozart's piano concerto" or even simply as "classical music" [6]. In works where the research methodology is described in more detail, the same works by Mozart are used: the famous 40th symphony and sonata in D major for two pianos KV 448 [24].

The ability of music to change the emotional state of a person was known to the ancient Greeks, who used music as a means of achieving harmony between the external physical and internal mental world of a person. This principle has become fundamental for modern MT [13]. The relationship between the emotional content of music and the emotional effect produced by it formed the basis of the theory of musical emotions, which has received universal recognition [38]. In accordance with
this theory, a person perceives the emotions embedded in a musical work by the
composer in the refraction of his own consciousness. And this means that for the
practical solution of the task, it is necessary to take into account the features of not
only the musical work, but also the personal characteristics of the listener.

The problem of determining the emotional content of a musical work has been
studied quite deeply. Thanks to the research of recent years, all the structural
components of a musical work have been studied in detail, the totality of which
determines the emotional background created by this music: melody, tonality,
metro-rhythm, tempo, harmony, texture, timbre, dynamics, pitch, etc. [6]. It has
been established that with an increase in the rate, the number of heart contractions
and excitation of the nervous system increase. A slow pace has a calming effect,
inhibits the nervous system. A study of the influence of the musical mode showed
that the sad character of the melody is given by the minor mode, and the cheerful
one by the major one. The secret of the bright and cheerful impression produced by
Mozart's music is explained by the fact that almost all of it is written in major [21].

Numerous studies of the effects of music with different characteristics have
made it possible to develop an algorithm for determining the emotional content of
music: a slow tempo with a minor color modulates the emotion of sadness and
melancholy; slow pace with a major coloring – a feeling of peace, relaxation and
tranquility; fast tempo with minor coloring causes anger and fearlessness; a fast
tempo with a major coloring creates an emotion of joy, jubilation. It is the variety of
musical means of expression that determines the positive influence of classical
music [36]. Thus, it is possible to select musical works with the required emotional
content only on the basis of a comprehensive assessment, taking into account a
number of characteristics: melody, tempo-rhythm, ladotonality, harmony, timbre,
texture and other means of musical expression. Without the help of a professional
musician, the correct and quick solution of such a problem seems to be very difficult.
This conclusion led us to think about the "two side of the coin": can listeners without
musical education recognize musical emotions as accurately as experts? Fortunately,
the fears were only partially justified. It turned out that the ability to emotionally
understand music is fundamental, primary and evolutionarily rooted, little dependent
on gender, age, education and other factors [35]. Six basic universal emotions
(happiness, sadness, fear, disgust, anger, surprise) are confidently perceived by
listeners with different cultural traditions even in music unknown to them. The main
emotions in music are confidently determined even by children of 5-6 years old [11].

An analytical review of studies on the problem of perception of musical
emotions showed that the means of musical expression are much richer in their
capabilities than the literary language. The emotional content of a piece of music
often cannot have an equivalent verbal description. Multifaceted and contrasting in
their emotional content, musical works are indeed difficult to perceive. The accuracy
of the interpretation of such music depends on the individual's ability to experience
and evaluate their own feelings [18]. Thus, only musical works with a pronounced
emotional content are suitable for our music library. According to experts, it is the classical music of the Baroque era and the Viennese classics, which has a clear rhythm and modal certainty, that best meets these requirements [19].

The pathogenetic features of any disease determine not only the characteristic clinical picture, but also the typological changes in the psycho-emotional state of the patient. Dyspeptic syndrome makes patients with chronic colitis similar to each other and unlike post-infarction patients; the same can be said about patients with respiratory failure against the background of obstructive diseases of the broncho-pulmonary system [20]. That is why patients of the specialized inpatient department (cardiology, gastroenterology, neurology) represent a relatively homogeneous psychotherapeutic group. The use of a general MT strategy for a group of people who are in the same conditions and therefore experience similar feelings is quite justified. This approach is supported by the success of group MT in nursing homes [33], pediatric hospitals [32], and palliative care units for cancer patients [31].

So, the algorithm for compiling a music library is defined: if there is a set of musical works with easily recognizable emotional content, a full-time medical psychologist of a medical diagnostic institution will easily make the necessary selection for a particular department, taking into account the psychological characteristics of its patients. When forming a music library, it must be taken into account that the frequent repetition of melodies will reduce the produced effect of emotional impact – that is, cause addiction. Back in 1966, Thompson R. and Spencer W. found that prolonged stimulation leads to a gradual weakening of the response [3]. The effect of addiction to the emotional impact of music is well studied and must be taken into account in the methodological support of the purity of the experiment – for example, in assessing the analgesic or relaxing effect of MT [27]. Thus, a periodic change in the stimulus is necessary, and in our case, a large number of pieces of music. If the music library is selected for outpatient treatment and diagnostic departments, where music should sound for about 6 hours a day and not be repeated during the week, then you must have at least 36 hours of audio recordings. For hospitals where the patient can stay from one to three weeks, the music library should be 2-3 times larger. Even a musician will have to analyze several times more volume of music to compile such a music library. Scientific developments of techniques to “machine” for determine the emotional content of music give us hope to simplify the solution of the problem and do without the help of a musicologist. Computer programs that analyze digitized music already exist and it is not surprising that the algorithm of their work includes the analysis of melody, rhythm, tempo and timbre [39].

Thus, with the help of a full-time specialist and the involvement of a professional musician, it is possible to create a specialized music library for any medical and diagnostic unit. The algorithm for organizing passive music therapy proposed on the basis of the analysis of scientific literature is universal and is applicable not only to healthcare institutions, but also to all organizations without
exception where people study or work: schools, universities, industrial enterprises and offices. However, the practical and theoretical value of the performed analysis is not limited to this. An analysis of the practical implementation of one of the methods of MT revealed the key problem of professional education of specialists in music therapy. At the moment, even in Europe and the USA, the specialty of a music therapist also does not imply a mandatory higher medical education. Such a system has developed historically, since MT at one time branched off precisely from psychology. Most psychologists in all countries of the world receive their education in pedagogical universities, and only a small part - as a result of specialization after receiving a medical degree. Both psychologists (without medical education) and music therapists feel insecure in the practice of public health. Although the work of music therapists in medical institutions is regulated and even documented according to the developed standard, the lack of medical education hinders the development of the specialty and limits the possibilities of the method in clinical medicine [26], famous a Persian poet, practitioner of Galenic medicine Abu al-Faraj 'Ali ibn al-Husayn ibn Hindu (died 1032) wrote in his treatise “The Key to Medicine” that a doctor must know about the effect of various melodies on a person in order to apply appropriate melodies for treatment [12]. After 1200 years, modern specialists confirmed this formula for the profession of music therapist [26]. The European Association of Music Therapists is forced to rebuild its educational system; the first stage of the reorganization was the transfer of education from the classrooms of universities to the walls of clinics. The restructuring of the education system is aimed at creating a complete correspondence between the education of music therapists and the requirements of practical healthcare [2].

Thus, the method of interaction between a medical psychologist and a professional musicologist proposed by us is more in line with the requirements of practical healthcare in terms of its functionality than a certified music therapist who does not have a higher medical education.

**Conclusions.** An analysis of scientific literature has shown that it is possible to create a positive emotional background with the help of classical music in hospitals. A prerequisite for the practical implementation of the goal is the cooperation of two experts: a medical psychologist and a professional musician. The result of such cooperation should be the formation of a classical music library with a given positive emotional content, the specificity of which is determined by the characteristics of the psychotherapeutic group (for example, the typological psychological characteristics of patients with pathology of a certain organ system).

**References:**


Література:


