

A Comparative Study of the Clinical Efficacy of Receptive Music Therapy in the Complex Treatment of Anxiety and Depressive Disorders

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Abstract

The widespread use of the method of receptive music therapy (RMT) in the treatment of anxiety and depressive disorders, as well as the emergence of innovative methods of music therapy, determine the relevance of a comparative study of its effectiveness in the complex therapy of these disorders. The aim of the research is to develop a scientific justification for the use of a computer program or mobile application for receptive music therapy in the complex treatment of anxiety and depressive disorders. The final sample included 72 respondents based on the developed inclusion criteria who were diagnosed with an anxiety disorder or depressive episode based on the ICD criteria. The study participants were divided into homogeneous groups, where the respondents who made up the first group underwent a thirty-day course of RMT and took pharmacotherapy with antidepressants, the second group - respondents who took only pharmacotherapy with antidepressants, respondents from the third group made up two subgroups: one (control) underwent a thirty-day course, the second - a ninety-day course of RMT. Music therapy was performed using a computer program or a mobile smartphone application My Energy Stream (MES). The assessment of the dynamics of the condition of the study participants was carried out using valid and reliable psychometric scales Brief Psychiatric Rating Scale and Patient Health Questionnaire, statistical processing of the data obtained was carried out using Statistica 7.0 software packages. The effectiveness of receptive music therapy using a computer program or mobile application in the complex treatment of anxiety and depressive disorders has been reliably confirmed, and the statistically reliable effectiveness of the music therapy program for a period of at least 90 days has been established. The use of a computer program or a mobile application for RMT can be recommended for practical use by specialists.

Keywords: Comparative Study; Receptive Music Therapy; Anxiety; Depression

Introduction and Background

Medical statistics show a persistent trend towards an increase in the number of cases of anxiety and depressive disorders, which can be recognized as a kind of scourge of modernity, when the whole world, and in particular Russian society, is facing new challenges, conflicts, technological transformation and a steadily growing flow of information. According to the WHO's combined data, from 38 to 42% of all patients visiting the offices of somatic doctors belong to the group of psychosomatic disorders, and up to 20% of the population needs

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qualified help at least once in their lives. Among all applicants to polyclinics, the proportion of people with individual mental disorders reaches 30% [5]. It is known that mental disorders cause not only significant social, but also economic damage, therefore, approaches to their therapy remain one of the main challenges facing modern psychological and psychotherapeutic science and practice. That is why the emergence of new methods of treating neurotic disorders always arouses the interest of the professional community, whereas their implementation in practice can often be difficult due to a certain conservatism of practitioners in the field of mental health (psychiatrists, psychotherapists, clinical psychologists, etc.) and their skeptical attitude towards alternative approaches. A way out of this situation may be to conduct comparative studies of new therapies for anxiety and depressive disorders, clearly demonstrating the possibilities of new techniques to overcome barriers in terms of their subsequent practical application by practitioners.

Music therapy is a system of psychosomatic regulation of human body functions based on the simultaneous influence of acoustic waves organized into a musical structure [11]. Some experts attribute music therapy to one of the special methods of psychotherapy/art therapy [12]. At the same time, there is a point of view that music therapy is an area of restorative medicine that uses various musical and acoustic methods, technologies and approaches (more than 50 today) to correct mental and physical health [minds].

There is widespread information in the literature that the use of music for medicinal purposes belongs to the works of Hippocrates and Avicenna, in addition, the healing effects of music are traditionally used in the cultures of the East, India, Japan and China [16]. It is noteworthy that since 1985, the World Federation of Music Therapy (WFMT) has been actively engaged in scientific and educational activities [18]. The method of music therapy is based on the influence of melody on the psycho-emotional state of a person. There are several forms of music therapy - active, in which a person participates in the process of playing music, passive or receptive (listening to musical compositions, and integrative, which is a combination of music with another type of creative activity) [1,9].

Research by specialists proves the effect of music therapy on improving the functioning of the nervous, cardiovascular and respiratory systems, reducing stress hormone levels, improving sleep, working capacity, as well as the ability to correct fears, phobias, depression and other anxiety disorders [3,12,13]. A reliable potentiating effect of music therapy on the adaptive reactions of the nervous system (including there are positive results on neurorehabilitation of newborns), the use of music therapy is promising not only as monotherapy, but in complex treatment as an auxiliary method that potentiates the effects of basic (pharmacotherapy, psychotherapy) techniques [2].

M. de Witte., *et al.* (2020) found that listening to music is closely associated with stress reduction by reducing physiological arousal, as evidenced by a decrease in cortisol levels, heart rate and average blood pressure. In addition, it has been found that music can reduce negative emotions and feelings such as subjective anxiety, a state of psychological stress, anxiety or nervousness and can enhance positive emotions and feelings such as feeling happy. A remarkable conclusion in their analysis indicates that music, due to its effects, has been proven to reduce stress levels and provide a “distraction” from stress-enhancing feelings or thoughts, and music therapy in the therapeutic process can be perceived as a form of positive overcoming difficulties [4].

Statement of the problem

The advantages of music therapy include the effectiveness of influencing physiological processes, regulating them depending on the rhythm of the music, as well as the absence of contraindications. Music therapy can be used as one of the safe and effective methods to overcome phobias and stressful situations, which allows it to be integrated into creative processes or used independently [15]. The possible availability of RMT as a tool for self-conducting therapeutic sessions can be a significant advantage. The very possibility of independent music therapy by patients is questioned: S. Aalbers., *et al.* (2017) in a systematic review from the Cochrane Library database, they conclude that specific methods and techniques of music therapy may require special training of specialists [1]. In addition, there is a problem of limited availability of the RMT method that meets the needs of people from different social and cultural backgrounds, which is a serious problem for widespread use of the technique. In addition, the time constraints of therapy make it difficult to choose music and

may reduce its effectiveness [6]. The solution may be the use of modern digital instruments for music therapy, which, on the one hand, establish clear therapeutic algorithms, on the other hand, provide appropriate instructions during sessions.

Such promising types of receptive music therapy include digital music therapy, conducted using a computer program, as well as a mobile smartphone application My Energy Stream, developed by Cybernet LLC. Previously, the acoustic characteristics of the musical compositions of the digital products My Energy Stream were studied using the computer program Sound Forge Pro 11, and spectral analysis was also carried out [14]. During the test, it was found that the compositions are presented in the form of 82 separate tracks of electronic music similar in nature, in digital format, lasting 50-60 minutes, in the New Age genre, in the ambient style, which is characterized by a soft color and smooth modulations with a slow tempo (strong fractions < 60 beats/min), as well as the smooth, undulating nature of the melodies. The frequencies of acoustic signals are mainly in the range of 65.41 - 987.75 Hz, and the level of dominant sound pressure is ≤ 45 dB, which corresponds to musical acoustic S-algorithms characterized by a pronounced sedative effect, allowing the method to be used in correctional practice.

Research Objective

The aim of this study was to evaluate the effectiveness of the use of a digital form of receptive music therapy - a computer program or a mobile application for smartphones My Energy Stream as a part of therapeutic strategies for the treatment of anxiety and depressive disorders in a comparative aspect, as well as the development of a scientific justification for the expediency of using this form of receptive music therapy.

Materials and Methods

Study setting

The study was conducted at the Kazansky Medical Center, Russia in 2023. The final sample of this study included 72 respondents (47 women and 25 men), based on the selection criteria developed by the authors. The demographic characteristics of the groups are presented in the next section of this publication. The inclusion/non-inclusion criteria were defined as: adults aged 18 - 55 years who were diagnosed with an anxiety disorder or a depressive episode of mild or moderate severity in accordance with the criteria of the International Classification of Diseases. The duration of the symptoms is at least 1 month, the absence of pronounced comorbid mental and somatic pathology in a state of decompensation. The data for each respondent was entered into a specially designed registration card based on informed voluntary consent obtained before inclusion in the study, as well as in compliance with the principles of processing and preservation of personal data. The format of the study corresponded to the Helsinki Declaration and the Guidelines for Good Clinical Practice (GCP), the authors received a positive conclusion from the Local Ethics Committee.

Sampling and research procedures

At the start of the study, all participants were divided into 3 groups, 20 respondents each in the first and second groups, and the third comparison group initially consisted of 32 respondents. Subjects from groups 1 and 2 received standard therapy with antidepressants - selective serotonin reuptake inhibitors - in accordance with Russian clinical guidelines for the treatment of anxiety and depressive disorders in moderate therapeutic dosages. Respondents from group 1, along with pharmacotherapy, underwent a course of receptive music therapy (hereinafter RMT) using a computer program or a mobile smartphone application My Energy Stream, listening to the presented compositions daily during the daytime and evening for 30 minutes a day for 30 days. Respondents from the 3rd (control) group underwent only RMT, during which 2 subgroups were formed: 3.1 - 19 respondents from this group completed the RMT program within 30 days, 3.2 - 13 study participants - within 90 days. This subsequently made it possible to obtain additional comparative data, and to use subgroup 3.1 as a control.

To assess the dynamics of the respondents' condition, a change in the indicators of the Brief Psychiatric rating Scale (BPRS) was used as the main indicator of the effectiveness of therapy, which contains 18 signs evaluated in 7 degrees of severity combining individual main signs: 1) anxiety depression (signs 1, 2, 5, 9), 2) form-based thinking disorders (signs 4, 8, 12, 15), 3) apathy/lethargy (signs 3, 13, 16, 18), 4) suspicion/hostility (signs 10, 11, 14), 5) excitement/tension (signs 6, 7, 17) [8,17]. An improved version of the PRIME-MD questionnaire, called the Patient Health Questionnaire (PHQ) in its short version PHQ-4, was used as a secondary indicator to assess the dynamics of the respondents' condition [7]. The BPRS assessment was performed at the beginning of the study (before the start of BP, RMT therapy), then for a period of 30 days and, in the case of subgroup 3.2, for a period of 90 days of the study.

The study participants kept a specially designed self-observation diary on a daily basis, and the respondents began a course of receptive music therapy after being instructed on using a computer program or a mobile application for smartphones, My Energy Stream. The study participants were provided with a specially generated activation code to control access and track the moment of compliance with the program activation requirements.

The combined data for all the studied groups were analyzed. The primary effectiveness analysis was performed for a group of respondents who received BP in combination with RMT - they were examined on the BPRS scale initially and after 30 days of the study. Changes from the level of the initial assessment for the total BPRS score and individual indicators of the factor model, as well as the PHQ scale score, were evaluated for groups of study participants in comparison with subgroup 3.1.

Data analysis

Statistical processing of the obtained data was carried out using the Microsoft Office 2021 and Statistica 7.0 software packages. The results are presented as an average value and a standard deviation, the reliability of differences in observations was evaluated according to the Mann-Whitney criterion. The differences were considered significant at a significance level of $p < 0.05$.

Results

Overview

The groups of respondents are fairly homogeneous in terms of sociodemographic and clinical characteristics, which made it possible to use the combined data on the study participants for the purposes of this research.

Indicator	Group 1 (n = 20)	Group 2 (n = 20)	Group 3	
			Subgroup 3.2 (n = 13)	Subgroup 3.1 (n = 19)
Gender, n (%)				
Female	14	12	9	12
Male	6	8	4	7
Age, years				
Average	34,2	33,6	31,9	32,7
Psychometric testing				
The average value of the total BPRS score	110,8	109,7	111,2	110,3
The average value of the PHQ scale score	10,1	9,7	10,4	9,8

Table 1: Showing demographic and baseline clinical data of the respondents.

Differences in treatment outcomes in the groups

The therapy programs implemented in group 1 (n = 20), group 2 (n = 20), as well as subgroup 3.2 (n = 13) led to statistically significant positive dynamics in comparison with the control subgroup 3.1 (n = 19) according to the total BPRS score and for each of the five factors. The dynamics of the average values of points on the BPRS scale in comparison with the control subgroup is represented by the values:

- 55.2 in group 1 versus - 9.1 in the control subgroup (p < 0.001);
- 42.6 in group 2 versus - 9.1 in the control subgroup (p < 0.01);
- 31.4 in subgroup 3.2. versus - 9.1 in the control a subgroup (p < 0.05).

Statistically insignificant changes in the average values on the BPRS scale were recorded in the control subgroup.

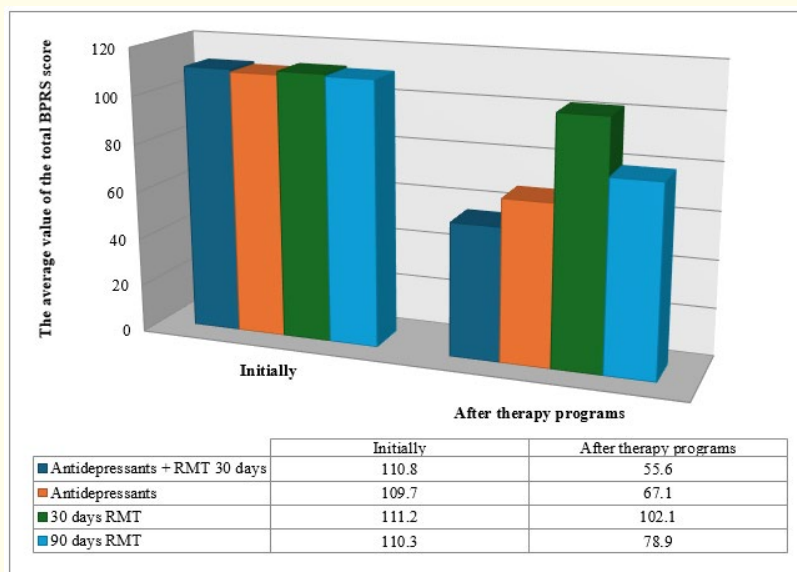


Figure 1: Showing dynamics of average values on the BPRS scale.

A combined analysis of the data on the dynamics of the average values of the PHQ-4 scale showed results comparable to the results within the dynamics of the BPRS scale. The dynamics of the average PHQ-4 scores in comparison with the control subgroup is represented by the values:

- 6.7 in group 1 versus - 0.9 in the control subgroup (p < 0.001);
- 5.5 in group 2 versus - 0.9 in the control subgroup (p < 0.001);
- 2.8 in subgroup 3.2 versus - 0.9 in the control subgroup (p < 0.05). The dynamics of the average values on the PH-4 scale in the control subgroup turned out to be statistically insignificant.

Discussion

Overview

The results of this study are consistent with the available evidence-based evidence indicating a positive experience in the use of music therapy in the treatment of anxiety and depressive disorders [14]. The possibilities of the innovative RMT method - a computer

program or a mobile smartphone application My Energy Stream - also made it possible to include RMT in complex therapy and conduct a comparative analysis.

RMT effect on anxiety and depression

A comparative study demonstrated the greatest clinical effectiveness when using RMT MES in the complex therapy of anxiety and depression, along with the use of pharmacological approaches to treatment. The data obtained indicate a significant positive effect of music therapy, provided that a sufficiently long period of the therapy program is observed for at least 90 days). In the control subgroup, there was no significant dynamics in the condition of the respondents, and a slight change in the average total average score on the BPRS scale cannot be recognized as statistically significant.

The results of this study do not contradict the conclusions of previously published works and confirm the prospects of scientific development of the method of receptive music therapy in comparison with other types of psychotherapy. The data available today allow us to recommend RMT for practical use, and the developed tools for its implementation, such as computer programs and mobile applications for smartphones, make this method as accessible as possible.

Conclusions and Recommendations

1. Receptive music therapy has shown positive efficacy when used in treatment programs for anxiety and depressive disorders;
2. The study of the combination of RMT with other types of psychotherapy seems promising;
3. It is advisable to recommend the use of a computer program or a mobile application for smartphones My Energy Stream as a method with sufficient efficiency, provided that the recommended approaches to its use are followed. The absence of contraindications makes it possible to use the technique not only in the practice of doctors specializing in the treatment of mental disorders, and clinical psychologists, but also in the activities of specialists in helping professions (rehabilitation doctors, social workers, etc.).

Conflict of Interest/Funding

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Contribution of the Authors

K. Yu. Zalmunin-Literature review, experimental design, collecting and preparation of samples, writing the article; A. D. Gubaidullina-Collecting and preparation of samples, data analysis.

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