

# Approaches to psychocorrection of cognitive disorders in people who have suffered ischemic stroke

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In approaches to psychocorrection of patients after a stroke, it is necessary to take into account the personality of patients, the stages of the process, adherence to treatment, individuality, a combination of influences, and continuity.

**The Aim.** Assess the effectiveness of the program of psychocorrection of cognitive disorders in people who have suffered an ischemic stroke.

**Materials and methods.** On the basis of the State Institution "UD SRI MSPI MZH of Ukraine" 83 patients with stage III hypertension were examined. with the consequences of cerebral stroke, who were divided into two clusters (cluster I - 40 people with mild (MilCI) and cluster II - 43 people with moderate (ModCI) cognitive impairments.

**Results.** As a result of combined treatment, long-term memory in people with MilCI and ModCI significantly improved - by 19,4 and 49,0%, figurative - by 12,9 and 50,7%, visual - by 22,0 and 31,5%, substantive - by 18,0 and 37,0% and the volume of short-term memory - by 19,7 and 22,9%. Memorization and short-term memory also improved; in both groups, memorization of the first test increased - by 12,9 and 19,1%, the second test - by 5,8 and 20,3%, the third test - by 6,5 and 26,3%, the fourth sample - by 2,3 and 30,1% and short-term memory - by 5,6 and 19,7%. Selective attention in patients with MilCI and ModCI probably increased by 36,8 and 47,8% and the level of logical thinking - by 12,8 and 23,7% and improved work efficiency - by 13,7 and 17,0%.

**Conclusions.** We have developed a model of psychocorrection based on methodology (body-oriented and psychophysiological approaches); principles of complexity, differentiation, systematicity, stages and sequence; components (informational, emotional and behavioral); levels (internal and interpersonal and social); targets (psychological and cognitive disorders, limitations of vital activity); Art therapy methods (drawing and coloring, dance and music therapy, fairy tale therapy) can be widely use

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## Introduction

Existing approaches to psychological correction of patients with stroke are based on certain principles: the leading role of the patient's personality, the stages of psychological rehabilitation, awareness and interest of patients in recovery, individuality, different levels of interventions, continuity, creation of a humanistic environment [1, 2, 3]; differentiation, complexity, stages, sequence, and include three components: informational (cognitive), emotional (affective), behavioral (conative) [4]; systematicity and the need for interventions at many levels (biological, psychological, social), with stages of influence, interconnectedness of activities, availability of information and correspondence of tasks to the capabilities of patients [5, 6]; use of medical, medical-psychological, socio-psychological and professional influence [7]. The stages of psychological rehabilitation that have personal orientations are distinguished: 1st stage (from 2 to

6 months) in which the influence is aimed at restoring the integrative image of the "I"; 2nd stage (from 6 to 12 months) - the influence on interpersonal relationships in the family and society, associated with the loss or change of social roles of patients; Stage 3 (more than 12 months) - influence on the formation of new life values and meaning of life of patients [3].

Art therapy is a method of developing and changing the conscious and unconscious aspects of the personality psyche through the use of various forms and types of art. According to Allida S. et al, 2023, the tasks of art therapy are: focusing a person's attention on their feelings and sensations; creating optimal conditions for clear verbalization and processing of the patient's thoughts and feelings, which he is used to suppressing; helping the patient find a socially acceptable way out of both positive and negative feelings. The leading technique of art therapy is the technique of active imagination, which opens up to the patient unlimited possibilities of his own realization and expression in creativity with active knowledge of his own "I". The mechanism of psychological collective influence of art therapy is the ability of art in a special symbolic form to reconstruct a conflict-traumatic situation and find its solution through the structuring of this situation with the help of the patient's creative abilities. Art therapy techniques are based on the idea of anyone's ability to reform their own conflicts into visual forms [8].

Art therapy has three forms: active, passive and mixed. The passive form involves the patient using works of art created by other people (viewing paintings, reading books, listening to music). In the active form of art therapy, the person himself creates products of creativity: drawings, sculptures, stories, musical compositions, spontaneous dances. The mixed form uses both existing works of art (musical works, paintings, fairy tales) and those created by the patients themselves [9, 10]. Fairy tale therapy - as a method of psychotherapeutic influence has been known since ancient times, but today it has begun to be given much more attention, given the need to find new ways and methods of rehabilitation of patients with stroke [11, 12]. Fairy tale therapy, one of the techniques of art therapy, is a method of psychotherapeutic influence on the personality through a fairy tale, which contributes to the correction of problems and the development of the personality [13]. The goal of fairy tale therapy is to correct characterological features, behavior, and the internal picture of the disease [14, 15].

Music therapy, according to Strzemecka, J, 2013, is the controlled use of sounds and music in the treatment and rehabilitation of patients, which includes reproduction, fantasizing, improvisation using the voice or selected musical instruments or listening to specially selected musical works. The use of music therapy provides the following effects: allows overcoming psychological defenses (calming or activating, setting the mood or interest); helps develop the communicative or creative abilities of a person; increases self-esteem on the basis of self-actualization; promotes the response of feelings; helps to experience catharsis; develops empathic abilities; forms relationships with a psychologist and other people, contributes to the establishment and strengthening of interpersonal relationships; increases social activity; facilitates the formation of new relationships and attitudes [16].

## **The aim**

Assess the effectiveness of a program of psychocorrection of cognitive disorders in people who have suffered an ischemic stroke.

## **Materials and methods**

On the basis of the State Institution «Ukrainian State Research Institute of Medical and Social Problems of Disability of the Ministry of Health of Ukraine», after obtaining informed consent, 83 patients with stage III hypertension with ischemic stroke (consequences of cerebral infarction I 69.3) were examined within the framework of the research project: «Mechanisms of the formation of limitations in vital activity due to cognitive dysfunction in arterial hypertension (state

registration number 0114U003047)».

All patients received information for patients and signed the «Informed voluntary consent of the patient for diagnostics, treatment and for surgery and anesthesia» (form No. 003-6/o) and «Informed voluntary consent of the patient for the processing of personal data», according to the Order of the Ministry of Health of Ukraine No 110 dated February 14, 2012 [17]. The study protocol was drawn up in accordance with the Declaration of Helsinki [18].

The inclusion criterion for the study was a previous ischemic stroke of about or more than 1 year, confirmed by medical records and magnetic resonance imaging results, Barthel index above 65 points. Exclusion criteria: the presence of pronounced cognitive disorders and psychiatric pathology, Barthel index below 65 points, refusal of treatment.

83 patients with ischemic stroke on the background of arterial hypertension (AH) were divided into two clusters (cluster I – 40 people with a previous stroke and mild cognitive impairment (MilCI) and cluster II – 43 people with stage III AH and moderate cognitive impairment (ModCI). Among patients with stage III AH in clusters I and II there were: men – 22 and 32, women – 18 and 11 people, their average age was  $49.98 \pm 3.15$  and  $51.02 \pm 2.13$  years, the duration of AH in them –  $7.65 \pm 3.11$  and  $4.86 \pm 2.56$  years, the age of the previous stroke in all people in these clusters – more than 1 year. In people in clusters I and II, the consequences of the stroke were confirmed according to medical documentation or magnetic resonance imaging. Ischemic The stroke was transferred in the left hemisphere in 11 and 19, in the right hemisphere – in 13, in the vertebrobasilar basin – in 14 and 6, in both hemispheres – in 2 persons.

Attention in persons with stage III hypertension was studied using: Schulte tables, Munstberger's method, Benton's correction table [19]. Memory was studied using tests: figurative memory, visual memory, substantive memory, short-term memory capacity, memorization of 10 words according to A. R. Luria [19]. According to the «Emotional Intelligence Questionnaire (EMI)» by D. V. Lyusin, the features of emotional intelligence were determined [20]. We assessed general mental abilities using a short orientation test (SOT); thinking processes – using the methods of highlighting essential features, Ebbinghaus, eliminating unnecessary and simple analogies [21-25].

The mathematical processing of the research results was performed using the methods of mathematical statistics [26].

Psychocorrection of cognitive disorders against the background of standard drug treatment was carried out for 14 days (1-2 trial sessions, in the morning – music therapy and dance therapy for 1 hour, and in the afternoon – art therapy (drawing and coloring and fairy tale therapy for 1-1,5 hours) in groups of 2-3 people. Depending on the nature of cognitive disorders and limitations in patients' vital activities, the specific weight of each part of the program could vary.

Psychocorrection of cognitive disorders against the background of standard drug treatment was carried out in group 2 (16 people with ischemic stroke and MilCI) and group 3 (13 patients with ischemic stroke and ModCI); in group 1 (control), which included 12 patients with ischemic stroke and MilCI and ModCI, psychocorrection was not carried out. Short-term assessment of effectiveness took place before and after the course of psychocorrection in the hospital and 1 year after its completion.

## Results

Based on the motivational strategies of Fernandes JBet al, 2024 [27], a model of psychocorrection of cognitive disorders was proposed, which involves determining mild, moderate and severe cognitive disorders and degrees of life limitations in patients; developing a system, principles and methods of psychological correction of cognitive disorders aimed at reducing life limitations; assessing its effectiveness and psychological rehabilitation prognosis [28].

Despite the fact that the patients with MilCI and ModCI examined in the work had long suffered an ischemic stroke, we identified changes in their personal and characterological traits, which led to the formation of an internal picture of the disease, in which social and psychological adaptation was disrupted in 95,1-95,4%. Therefore, the correction system we developed took into account intrapersonal (correction of the personality and its self-perception), interpersonal (correction of interpersonal relationships) and existential-psychological correction (stabilization of relationships, growth of the personality and reduction of limitations in the patients' vital activities). For this, we used art therapy methods: (drawing and coloring pictures, dance and music therapy, fairy tale therapy) [28].

The model of psychocorrection of cognitive disorders in individuals with arterial hypertension who have suffered an ischemic stroke that we have developed is based on the methodology (body-oriented and psychophysiological approaches); the principles of complexity, differentiation, systematicity, phasing and consistency; components (informational, emotional and behavioral); levels (intra- and interpersonal and social); targets (psychological and cognitive disorders, limitations of vital activity); methods of art therapy (drawing and coloring, dance and music therapy, fairy tale therapy) [28].

When building a correction program, certain conditions were met: all tasks were formed from simple to complex, emotional support, unconditional acceptance and positive reinforcement were used when communicating with the patient, regardless of the patients' successes, and targeted reinforcement of positive motivation for the correction of cognitive functions and limitations of vital activity was carried out both in individual and group work [27].

Before the start of individual classes, all patients were interviewed and examined for all mental functions. 1-2 trial classes were held with patients with ModCI in order to assess their ability and desire for learning and correction. Group classes were aimed at the correction of praxis (dynamic and constructive), gnosis (visual, auditory, tactile, proprioceptive), and optic-spatial functions. Tasks were used to correct memory (auditory, visual, spatial) and develop attention (auditory, visual, proprioceptive). The work in the group was also aimed at correcting the patient's attitude towards his disease, at forming positive compliance, creating an optimistic treatment and life perspective, at restoring ties with society) [3].

At the beginning and end of the classes, pulse and blood pressure were measured. The class began and ended with a 15-20 minute relaxation with listening to classical instrumental music (calm, cheerful and optimistic), while during dance therapy, music of different rhythms and performers chosen by the patients was used. The use of music therapy led to patients: overcoming their psychological defenses (calming or activating, mood or interest), developing their communicative and creative abilities, increasing self-esteem based on self-actualization, improving the response of feelings, developing empathy, establishing and developing interpersonal relationships, increasing social activity, and forming new relationships and attitudes.

The dance therapy session was held both during individual and group classes for 30 minutes in the morning. The leading tasks of dance therapy were: deepening the patients' awareness of the possibilities of restoring their own affected body functions, strengthening their sense of dignity by developing a positive "body image", developing social skills and conditions for creative interaction, making dance movements expressive in order to release hidden opportunities, gaining group experience and forming a closed, stable complex. Increasing motor activity, communicative training and organization, sociotherapeutic communication, the formation of behavioral stereotypes and their awareness by patients, emancipation of the personality - all this enhanced the effectiveness of dance therapy in patients. We most often used the following types of dance therapy: individual, pair and small group therapy. The effectiveness of dance therapy when working in groups was based on the fact that changes in movements led to changes in the quality of the personality, manifestations of individuality, sincerity, acceptance of myself as I am, and as a result, there is a change in attitudes and stereotypes of communication.

In the afternoon, classes with patients continued. To the accompaniment of classical music, patients were engaged in drawing, the session also lasted for 1 hour. Art therapy classes were aimed at restoring praxis (ideomotor, ideatory, constructive, dynamic), consolidating visual memory, perception of different colors, visual-figurative thinking, emotional response to negative experiences and emotional stabilization. Various techniques were used: drawing letters and signs, coloring drawings with pencils and felt-tip pens, creating cartoons. The drawings covered various topics, seasons, and distinct colors, and were used in individual and group work, followed by a discussion of the drawings.

The work with the patient was completed with fairy tale therapy - a method that allows using a fairy tale form to integrate the personality, expand consciousness, and improve interaction with the environment. Fairy tales perform a number of functions: forming emotional resonance (images of fairy tales affect consciousness and the subconscious, creating special conditions for communication), increasing the value of metaphor as a carrier of information (about vital events and values, the author's inner world), symbolic awareness of information (about the creation of the world, periods of human life and self-realization of men and women, difficulties and temptations of life and the possibilities of overcoming them, the value of friendship and love, life values, relationships with children and parents), forming moral immunity, and a holistic perception of the world.

The criteria for assessing the short-term effectiveness of psychocorrection in patients were selected as indicators of memory, attention, and thinking. As a result of the combined treatment, long-term memory significantly improved in groups with MilCI and ModCI - by 19,4 and 49,0%, figurative memory by 12,9 and 50,7%, visual memory by 22,0 and 31,5%, substantive memory by 18,0 and 37,0%, and short-term memory by 19,7 and 22,9%. Memorization and short-term memory also improved: with a trend in the group with MilCI and statistically significantly in the third group. In groups with MilCI and ModCI, memorization of the first test increased by 12,9 and 19,1%, the second test by 5,8 and 20,3%, the third test by 6,5 and 26,3%, the fourth test by 2,3 and 30,1%, and short-term memory by 5,6 and 19,7%.

Treatment and psychocorrection had less effect on the attention and thinking of patients. In patients of groups with MilCI and ModCI, the selectivity of attention increased significantly - by 36,8 and 47,8%, and the level of logical thinking - by 12,8 and 23,7%, and work efficiency improved - by 13,7 and 17,0%.

The criteria for assessing the long-term effectiveness of psychocorrection in patients with ischemic stroke and with MilCI and ModCI were selected, according to the model of psychocorrection of cognitive disorders, indicators of their personal characteristics, memory, attention, thinking and intelligence, as well as limitations in vital activity. Clinically, all the examined patients did not have a deterioration in neurological status during the year of observation. We assessed the psychological status after 1 year in all groups of the examined: during a repeated examination in the hospital - in 11 and 7 people and by the questionnaire method - in 5 and 6 patients of groups with MilCI and ModCI.

In patients with ischemic stroke and MilCI, one year after the course of psychocorrection, the levels of Hs-hypochondria decreased by 7,0% and Hy-hysteria - by 4,1%, and in people with ModCI, the indicators of Pd-psychopathy - by 10,4%, Pa-paranoia - by 4,8% and Sc-schizoidity - by 2,3%, which indicated an improvement in their socialization in society.

Positive changes in patients with ischemic stroke with both with MilCI and ModCI include a tendency to preserve their memory: an increase in group with MilCI of memorization - by 11,1%, figurative memory - by 17,2% and the volume of short-term memory - by 2,0%, in group with ModCI of memorization of the second - by 9,2%, the third - by 8,3%, the fourth sample - by 16,6%, short-term memory and its volume - by 12,1 and 16,3%, long-term memory - by 13,2%. Another positive feature of these patients should be considered the stability of attention: adaptation and

selectivity of attention remained practically at the same level, and in people in group with ModCI there was even a tendency to its improvement – by 8,9%.

The processes of intelligence and thinking were also taken into account by us in the long-term assessment of the effectiveness of psychocorrection in people with ischemic stroke. The positive features of the intelligence of those examined with MilCI and ModCI include the stability of understanding others' and one's own emotions in both groups, an increase in the ability to manage others' emotions – by 1,1% and expression control – by 4,4% and interpersonal emotional intelligence – by 2,3% in patients in group with MilCI, as well as the management of one's own and all emotions – by 1,7 and 0,5% in people in group with ModCI. Thinking processes and their productivity also remained at a stable level: in all three groups an increase in thinking productivity was observed – by 7,8, respectively; 2,4 and 13,8%, and in the surveyed groups with MilCI and ModCI, the levels of logical thinking also increased by 14,1 and 7,9%, and the understanding of logical connections by 32,1 and 14,2%.

## Discussion

The main goal of art therapy is to harmonize the inner world of a sick person, that is, to restore his ability to find optimal emotional balance, aimed at continuing activity in life [27]. The tasks of art therapy are: focusing the patient's attention on his feelings and emotions, creating optimal conditions that contribute to the clear verbalization and processing of those thoughts and feelings, finding an outlet for both positive and negative feelings. The main technique of art therapeutic influence is the activation of the imagination, which opens up unlimited opportunities for self-expression and self-realization in creativity for the active knowledge of his own "I". The mechanism of psychological collection influence of art therapy is that art allows in a certain symbolic form to reconstruct a conflict-traumatic situation and find its solution by restructuring this situation with the help of the creative abilities of the person himself [27].

Achieving positive psychocorrectional results in art therapy occurs due to: the development and strengthening of attention to one's feelings and experiences, which increase self-esteem; the actual creative process, which makes it possible to express one's feelings, needs for fantasy in the form of creative products (drawing, collage, sculpture, fairy tale, dance), which is a means of de-escalating a tense situation; the opportunity to relive internal conflicts of the past while uniting with one's own "unconscious" and communicating with it using symbols and images; a sense of internal control and order when organizing the surrounding space; gaining new experience [29].

According to Lo TLT, Lee JLC, Ho RTH, 2018, art therapy has three forms – active, passive and mixed. In the passive form, the patient uses works of art created by other people: looks at paintings, reads books, listens to musical works; in the active form, the patient creates his own products of creativity (drawings, sculptures, stories, musical compositions, spontaneous dances); in the mixed form, the patient uses existing works of art (musical works, paintings and fairy tales) to create his own [8].

One of the features of the art therapy process is the relationship between the patient and the psychotherapist, which is mediated by the artistic work and reflects the process of creative expression. The main concepts of the art therapy process are that psychotherapeutic relationships are an open "living" system that includes the patient, the psychotherapist and the product of creativity as the main elements; This system is characterized by openness, the presence of information flows that connect its elements with each other and the external environment, and goal setting; the presence of certain structural and functional characteristics [30].

Structural characteristics are determined by the presence of external boundaries of the system of psychotherapeutic relations, personal and interpersonal boundaries, which are determined by the norms of behavior of the patient and the psychotherapist and the role aspects of their interaction. The functional characteristics of this system include the variety of forms of behavior of the patient

and the psychotherapist during their direct and indirect artistic expression aimed at achieving a psychotherapeutic result. Various factors of psychotherapeutic influence and interventions used in art therapy can act as internal resources and mechanisms necessary to achieve certain psychotherapeutic results [31].

Systemic changes in the art therapeutic process can be considered at three main levels: intrapersonal (changes in the state, attitudes, methods of mental reaction of the patient and the psychotherapist); interpersonal (changes in the relationship between the patient and the psychotherapist); social (changes in the relationship of the person with the family, professional and wider social environment). Creative production is the third element of the system of psychotherapeutic relationships in art therapy and reflects systemic changes (at the intrapersonal, interpersonal and social levels) that occur at different stages of the art therapeutic process. Artistic expression and creative products are not only a mirror, but also one of the factors of these changes [30].

## Conclusions

1. The proposed model of psychocorrection of cognitive disorders involves the determination of mild, moderate and severe cognitive disorders and degrees of life limitations in patients with the consequences of cerebral stroke; development of a system, principles and methods of psychological correction of cognitive disorders aimed at reducing life limitations; assessment of its effectiveness and psychological rehabilitation prognosis.
2. Violation of social and psychological adaptation in almost 95% of people with the consequences of cerebral stroke, in whom changes in personal and characterological traits were diagnosed, the formation of a maladaptive internal picture of the disease, required the development of new approaches to their rehabilitation.
3. We have developed a model of psychocorrection based on the methodology (body-oriented and psychophysiological approaches); principles of complexity, differentiation, systematicity, phasing and consistency; components (informational, emotional and behavioral); levels (intra- and interpersonal and social); targets (psychological and cognitive disorders, limitations of vital activity); methods of art therapy (drawing and coloring, dance and music therapy, fairy tale therapy) can be widely used in the process of rehabilitation of patients with the consequences of cerebral stroke.
4. As a result of the combined intervention, which included drug treatment and psychocorrection, in individuals with mild and moderate cognitive impairment due to ischemic stroke, long-term memory significantly improved by 19,4 and 49,0%, figurative memory by 12,9 and 50,7%, visual memory by 22,0 and 31,5%, substantive memory by 18,0 and 37,0%, and short-term memory capacity by 19,7 and 22,9%, selective attention by 36,8 and 47,8%, logical thinking by 12,8 and 23,7%, and work efficiency improved by 13,7 and 17,0%.
5. One year after the course of treatment, patients with MilCI increased their memorization by 11,1%, figurative memory by 17,2%, and short-term memory by 2,0%; in the group with ModCI, short-term memory, its volume, and long-term memory increased by 12,1; 16,3 and 13,2%. In both groups, an increase in thinking productivity was observed by 2,4 and 13,8%, and in those examined with ModCI, the levels of logical thinking by 14,1 and 7,9%, and understanding of logical connections by 32,1 and 14,2%.

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