

## Pilot study on the use of art therapy techniques to improve the psycho-emotional state of educational psychologists

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### ABSTRACT

The aim of this study is to investigate the impact of art therapy on the psycho-emotional state of educational psychologists. The issue at hand is the prevalence of depression, anxiety, and emotional burnout among future educational psychologists, which can negatively affect their professional performance. To address this problem, the application of art therapy was proposed as a tool to improve the emotional health of students. The experiment involved 107 students aged 20-22 from the Yelabuga Institute of Kazan Federal University. The assessment of emotional state was conducted using the Beck Depression Inventory, the Spielberger-Hanin Anxiety Scale, and the Schreiner, Rosenberg, and Boyko tests. The results indicated that after three months of art therapy, the average level of depression decreased by 15%, anxiety levels decreased by 20%, and emotional burnout was reduced by 15%. Additionally, students' stress resistance increased by 20%. Thus, art therapy is an effective means for reducing the emotional burden on students. It is recommended to incorporate art therapy techniques into the curricula of universities, colleges, and secondary schools. Further research is necessary to confirm the effectiveness of art therapy among students of various specializations.

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## 1. INTRODUCTION

The success of a specialist in any field always directly depends on their professional skills and personal qualities [1]. These skills and qualities rest not only on the knowledge gained during training but also on self-knowledge. The latter implies a competent assessment of oneself and effective personal growth. According to interviews with such psychologists as Carol Dweck, Patricia Alexander, and Jacquelynne Eccles, the experts concluded about the qualities and methods that help to achieve success in a field of activity [2]. They noted the search and use of individuality in an approach to people, as well as the modifications of various methods with a vector for actualization [2]. Interviews with Frank Fischer, Hans Gruber, Heinz Mandl, and Alexander Renkl only confirmed the conclusions, however, these experts emphasized productivity in professional activity. The research of these scientists studied the characteristics and working habits of successful educational psychologists. The survey results showed that the experience of specialists at the very beginning of their journey is the defining point in the development of professional

qualities and productivity [3]. To achieve this result, each educational psychologist first needs to understand the structure of their personality and desires through introspection.

To evaluate and further work with the individual qualities of future specialists, it is necessary to employ the method of art therapy. Art classes have three main spheres of influence on personality: hedonistic (it is distracting), comforting, and compensatory (it promotes spiritual development) [4]. The paper considers the compensatory function of art therapy and its influence on the formation and development of certain qualities in future educational psychologists. The compensatory function is an opportunity to work out internal blocks and problems to achieve results and expand opportunities in the future. All this significantly affects the success of specialists in the field of pedagogical psychology [4], [5]. The concept of art therapy is to regulate emotions by transferring them with paints to canvas. This process involves using symbols or understandable images for a person who draws [6], [7]. This therapy does not require creative skills to participate. There are also various therapy options, that is, people can use any activity for self-expression: music, dancing, clay modeling, and so forth [8]. In addition to working out and relieving emotions, this psychotherapeutic practice allows participants to distract from the main problem and relax. Therefore, it applies to the treatment of depression, anxiety, and other psychological disorders [9].

Art therapy sessions regulate one's emotions through reflection and art. For example, fine art helps express emotions by drawing various images with paints on canvas. A method of writing implies writing down all emotional experiences on paper. The method of dance art therapy aims to achieve a distracting effect. This activity helps people avoid depressing thoughts and experiences since they begin to understand their emotions during sessions. People find it easier to express their emotions through objects or abstract images. At the same time, an art psychologist can visually track the progress of their patients and correct some nuances. During the sessions, the specialist monitors the change in a person's reaction to the triggers, setting situational tasks or conducting tests. The test questions concern the feelings and reactions of a person in certain cases [10].

One of the most popular techniques of art therapy is fine art. In a diagnostic sense, it can show the inner state of a person. The preferred colors can tell about mood, the power of emotions, and experienced emotions [11]–[13]. For instance, the use of dark and gloomy colors indicates isolation and depressive thoughts. In turn, muted shades embody detachment, while bright and warm convey a lively reaction and a vivid manifestation of emotions [13]. The colors combination allows specialist to conclude the psychological state of a patient [14]. Furthermore, the images and features of the drawn objects also play a role. Sharpened lines, hatching, and sharp transitions can indicate nervous overstrain and tendencies to neurosis. Smooth lines and curls characterize soft and dreamy people. The images that a person portrays also have important diagnostic significance. Some of them may suggest a tendency to severe psychiatric diseases [12], [13]. The locations of the objects in the picture are another important aspect. These diagnostic criteria can reveal the main problems of the examined person for further psychological assistance [15], [16]. The assistance covers the work with emotions and expression on paper with the help of paints, pencils, or crayons.

Art therapy is a relevant technique for the formation of professional qualities of future educational psychologists. It allows them to recognize psychological blocks and weaknesses, as well as work through them to achieve emotional stability and increase productivity. The ultimate goal of this therapy is to understand oneself and decide on the direction of professional activity [17]. The value categories undoubtedly underlie changes in educational systems. It is necessary to study differences and similarities in the value orientations of youth from different countries, as well as "movements" in the hierarchy of values. This study can find new directions in the content and organization of education and training for student youth.

The motivation of this study was to obtain additional data on the psychological state and its changes during the experiment with art therapy. The aim of the research is to study the impact of art therapy on the psycho-emotional state of educational psychologists. The study also identifies how art therapy reveals a person's strengths for understanding individuality and choosing a further path of development. The success of an educational psychologist directly depends on their personal qualities. Therefore, it was crucial to assess the level of psychological preparation and emotional state of the participants in the experiment. The methods of art therapy in the context of personality formation received insufficient scientific attention and require additional research and revision. The research task is to understand how the compensatory factor of art therapy affects students. To do this, it is necessary to assess the severity of certain emotional criteria before starting therapy, and then monitor the dynamics through post-testing. Another important task is the introduction and implementation of art therapy.

## 2. LITERATURE REVIEW

In the study on the influence of art therapy on the professional position and achievements of educational psychologists, the main trends of success are essential. To achieve success, one needs to find an

individual approach, as well as have a fairly large emotional resource. In this case, it can be reasonable to rely on the opinions of highly sought-after specialists in the field of psychology from Germany and the USA. These experts said that to achieve high results, it is necessary to increase productivity indicators, as well as always strive to study new techniques [3]. Interviews conducted with female educational psychologists showed that the most important factors for success are leadership qualities, perseverance, effective time management, and constant self-improvement [2]. All these qualities can be present only in an emotionally stable person. Students often face learning difficulties, anxiety during exams, and various crises that lead to burnout. Art therapy performs several functions: hedonistic, comforting, and compensatory. Hedonistic and compensatory functions rest on a distracting and relaxing effect, while compensatory function combats emotional problems and leads to self-development [4].

Currently, there are only a few methods of art therapy. These methods include painting, music, dancing, and any other kind of art. During the sessions, participants can draw pictures by transferring emotions to canvas (art therapy), record their emotions on paper by expressing them through words or symbols (writing therapy), or distract from problems (dance therapy). This strategy typically serves as a method of relieving mental pressure and improving morale. For example, Ilene Serlin (Oxford) practiced dance therapy to support women suffering from breast cancer. The technique proved to be successful in the context of improving the mental and emotional state of the participants [18]. The phenomenon of using art therapy as a palliative care opportunity is widespread. Therefore, the American Association of Art Therapists researched the impact of this strategy on people with incurable diseases. The research was under the guidance of a psychologist who conducted specialized sessions. Family members of terminally ill people also participated in similar sessions. As a result, the respondents demonstrated increased self-esteem, improved sensory and cognitive abilities, as well as emotional resilience and social skills. The research proved that art therapy helps to cope with stress and teaches psychological adaptation to various life situations [19]. Scientists from the Netherlands considered the technique of art therapy for the treatment of anxiety disorder. However, their conclusions regarding effectiveness were ambiguous. Thus, there is an urgent need for more research on this issue [20].

In the USA, researchers introduced art therapy for people with chronic diseases. The effectiveness of the therapy was insufficient. The authors associated the obtained result was a small sample and a lack of studies, like the researchers from the Netherlands [20], [21]. Scientists from the University of Massachusetts conducted review studies on the impact of various art therapy types (dance, art, music, and writing) on mental disorders. The therapy was low-risk and had high indicators of effectiveness. Nevertheless, the scientists failed to recognize these methods as valid due to the lack of standardization and consistency between the conducted studies. To confirm the feasibility of the studied therapy, it is necessary to create a common methodology and conduct additional tests [22]. In Sweden, this type of therapy allowed people with severe depression to go through an internal dialogue and come to the core of their problem. The artworks created by the participants during the session were evaluated by a psychotherapist who delved into the essence of these images. After that, the participants discussed the results in personal sessions with a psychotherapist to search for subconscious psychological blocks and fixations on problems [23]. Swedish researchers discussed changes in patients who underwent art therapy. The authors experimented with this type of therapy and noted its positive effect on the emotional background, the expression of feelings, self-esteem, and thoughts of the future [24].

Chinese research in the field of art therapy focused on the technique of art and its effects on depression, anxiety, and various cognitive disorders, including autism and schizophrenia. This technique can be an independent type of therapy, as well as an addition to the main treatment. The study proved that this art therapy revealed the emotions of patients and also served as a diagnostic criterion for their psychotherapists [25]. Researchers from Germany investigated the effect of art therapy on stressful states in people. As a result, the art therapy sessions significantly reduced stress levels and were effective in dealing with emotional burnout [26]. In Melbourne (Australia), scientists studied the use of art for supportive therapy of people with post-traumatic stress disorder. The results were insignificant. This outcome could be mainly due to the low quality of the experiment and, therefore, requires additional systematization and research [27].

In addition, an experiment conducted in Denmark studied the effect of art therapy on mental health and general well-being. The experiment proved that participation in creative programs relieved stress factors and improved the mental state of the study participants [28]. Given the data from different countries, in most cases, the art therapy technique was effective. It reduced stress that negatively affected people, regulated their emotional background, and helped them deal with internal blocks and conflicts. This strategy is becoming widely used for the treatment of various disorders (depression, anxiety, and cognitive impairment). It can serve as an additional method for studying the emotional state and problems of the subconscious. However, there is no complete agreement regarding the effectiveness of these techniques [20], [22], [27]. The reasons are the lack of a common methodology and structure for conducting research, as well as the difference in the

types of art therapy. Moreover, there is still an insufficient number of experiments. Most of the conducted experiments were randomized and did not have a clear sample.

### 3. METHOD

#### 3.1. Research design and sample

The research employed a randomized study to assess the impact of art therapy on personality and professional qualities. The experiment involved 3rd and 4th year students of the Yelabuga Institute of Kazan Federal University. All participants studied at the Department of Psychology and Pedagogy. The age of the respondents ranged from 20 to 22 years. The study group consisted of 107 participants. The sample size was calculated using the (1).

$$n = N \times Z^2 \times p \times (1 - p) / (N - 1) \times E^2 + Z^2 \times p \times (1 - p) \quad (1)$$

Where,  $n$  is the sample size,  $N$  is the population size (in this case, the number of third and fourth-year students at the Yelabuga Institute of Kazan Federal University),  $Z$  is the standard distribution coefficient for the sample,  $p$  is the estimated probability/proportion of individuals with the characteristic in the entire population, and  $E$  is the acceptable margin of error.

All students participating in the experiment, as well as others, attended therapy sessions three times a week after their main studies. An art therapy specialist conducted all sessions. The students did not receive additional psychotherapy.

#### 3.2. Experiment and statistical analysis

Before the integration of art therapy into the lives of students, the researchers tested psychological imbalance indicators. They included the Beck Depression Inventory, the Spielberger-Khanin Anxiety Scale, the Schreiner Stress Tolerance Test, the Rosenberg Self-Esteem Scale, and Boyko's Emotional Burnout test. The first test (Beck) is a questionnaire that includes 21 questions with 4 answer options each. The test assesses the level of a person's depressive state. The questions concern the quality of sleep, nutrition, well-being, sexual life, and suicidal tendencies [29]. The Spielberger-Khanin Anxiety Scale consists of 20 questions aimed at assessing restless thoughts, irritability, and mood levels [30]. The Schreiner test is an express diagnosis of stressful states; it identifies the degree of self-regulation and emotional lability during the action of various triggering situations [31]. The Rosenberg test is a technique for identifying the level of self-esteem, which includes 10 questions with four possible answers. Each answer option is assessed with a certain number of points. More points at the end of the test indicate higher levels of self-esteem [32]. Boyko's assessment technique is a test for emotional burnout, which diagnoses the level of emotional response to an irritant. The test consists of 84 questions [33]. All these tests determined the level of psychological problems of the respondents. All instruments demonstrated an adequate level of reliability, with Cronbach's alpha values as: 0.81 for the Beck Depression Inventory, 0.79 for The Spielberger-Khanin Anxiety Scale, 0.83 for the Schreiner Stress Tolerance Test, 0.88 for the Rosenberg Self-Esteem Scale, and 0.77 for Boyko's Emotional Burnout test. These tools could show the effectiveness of art therapy in changing the above factors, and as a result, in the formation of future professionals.

Before the experiment, all respondents had to complete these questionnaires to determine the level and vector of their psychological problems. The testing procedure took place in a university classroom under the guidance of a psychologist, who subsequently checked the results. All participants completed tests using printed questionnaires. The model of the randomized study implied art therapy among a group of students. The study lasted for 3 months. Among all types of art therapy, the method of fine art was the most suitable for the study [34]. The respondents participated in group sessions three times a week for 2 hours under the guidance of a qualified specialist in the field of psychology. The study participants drew pictures in the classroom using pencils, oil paints, watercolors, and gouache. Each student could draw what they liked best. The main task was to let emotions out on paper or canvas. The students could use any colors, symbols, and images to convey their feelings. Artistic skills were not essential. After creating the picture, the participants had to evaluate their work from a psychological point of view. The art therapist who conducted the sessions recorded and corrected the results. The expert explained why certain images personified an emotional reaction to a particular trigger.

Further, the students of the Department of Psychology and Pedagogy had to independently process the received information. The study was held at Kazan Federal University. The experiment used testing for depression, anxiety, emotional burnout, self-esteem, and stress resistance two more times (in the middle of the study (the sixth week) and at the end of the third month). To process the obtained data, this study utilized

a specialized program for statistical analysis called SPSS 26.0. The Microsoft Excel 2019 software package allowed for the interpretation and visualization of the results.

### 3.3. Limitations

The experiment had several limitations. Firstly, the participants in the experiment had different psychological blocks and were at different levels of general emotional state. Secondly, this research is a randomized study on art therapy's influence on future educational psychologists' personal qualities. Therefore, the calculation of all results rests on the arithmetic mean for the entire group. In the context of this experiment, art therapy is an element of self-development for masters of the Department of Psychology and Pedagogy. To use this technique and obtain similar results among people unrelated to psychology, it may be necessary to include additional individual sessions with a specialist in this field.

## 4. RESULTS

Before analyzing the results, it is necessary to evaluate the data obtained during the first testing of the experiment participants. All values are the average result of the sample. Thus, based on data from the Beck Depression Inventory, the level of depression among respondents was 40%. The Spielberger-Khanin Anxiety Scale showed that the average level of anxiety in the group was 50%. Emotional burnout reached 45% on average in the sample (Boyko's test). Therefore, the participants had certain problems with these criteria. However, the level of stress resistance was low, only 30%. The results of the self-esteem test were slightly better and were equal to 35%. This fact indicates a rather low level of self-esteem and low-stress tolerance. Figure 1 shows all the data.

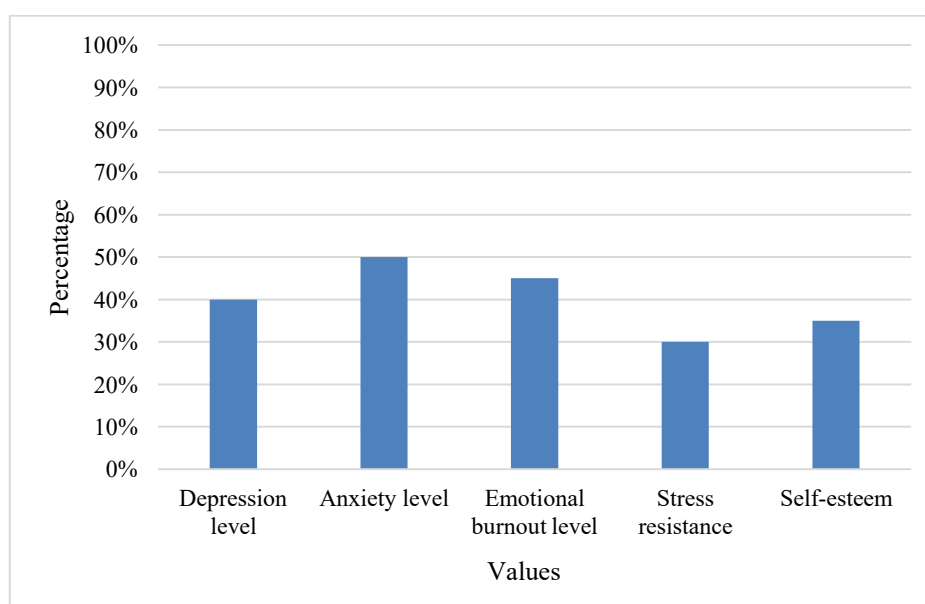


Figure 1. The results of the first testing

Then the participants worked according to the conditions of the experiment for another 6 weeks. After some time, the respondents again passed the same tests. The result showed that the level of depression on the Beck scale decreased by 5% and was 35%. The initial data on the anxiety test decreased by 10% and was equal to 40%. The level of emotional burnout among respondents decreased by 5% and was 40% at the time of the test. The indicator of stress resistance increased by 10% after the therapy. The level of self-esteem also increased by 10%. Figure 2 illustrates the results of an interim study.

The interim study revealed a decrease in the level of depression, anxiety, and emotional burnout, indicating an improvement in the emotional state of the participants. The level of stress tolerance and self-esteem increased during the experiment and this result is also a positive dynamic. At the interim stage, the art therapy had an impact on the emotional background and improved the inner qualities of the respondents.

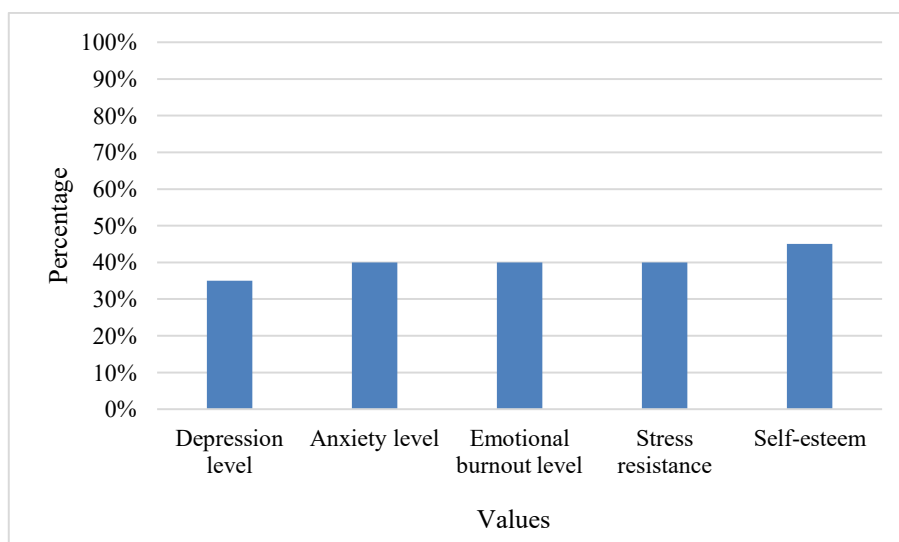


Figure 2. Interim testing

After another month and a half of art therapy sessions, the final test took place. Its results showed a decrease in depression by another 10%. As a result, the level of depression was 25%. The anxiety indicator decreased by 10% and was 30%. The level of emotional burnout also decreased by 10% and became 30%. At the same time, stress resistance increased to 50% (+10% of the previous result). The level of self-esteem this time increased by only 5% and was equal to 50% in total. Figure 3 shows the diagram with the results.

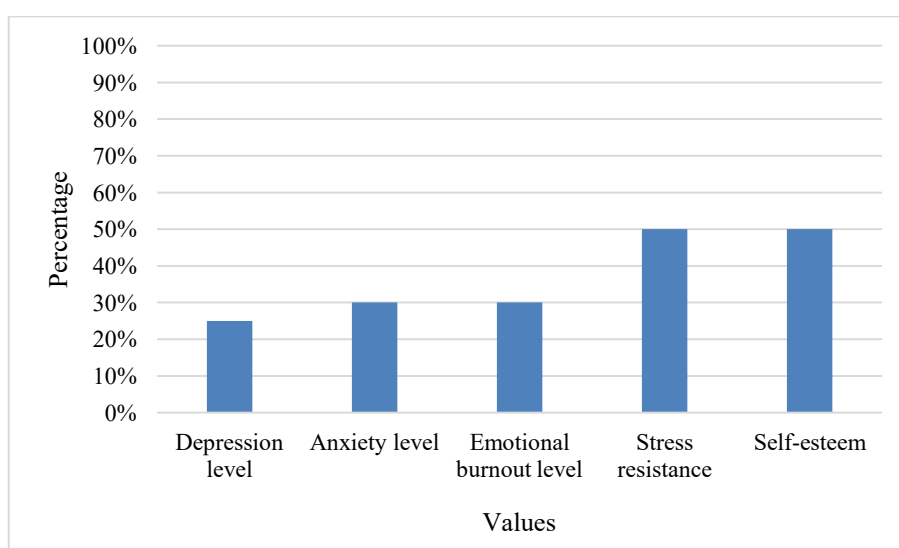


Figure 3. The results of the final testing

Based on all the data obtained, one can notice the effectiveness of art therapy sessions in the personality development of future teachers-psychologists. In the course of the study, there was an increase in the motivation for self-development among respondents, as shown by a survey of participants. One of the respondents said:

*“This technique really opened my eyes to some internal problems that I had been suppressing for a long time. Most importantly, it taught me how to work with them. I have really increased motivation for self-development thanks to art therapy.”* (Victor)

*“Art therapy helped me to distract myself from various disturbing thoughts. Thanks to it, I learned to differentiate my emotions and accept them. I began to feel confident, and I became motivated to improve my psychological skills.” (Alexandra)*

There were also many more positive comments from the participants of the program. This fact indicates an increase in the motivation of students to take part in art therapy practices and further develop themselves in the profession. Thus, therapy based on art effectively identifies problems and stabilizes the psychological state. Moreover, it increases motivation for further self-development. All these factors are important for the formation of personality and the development of professional competencies.

## 5. DISCUSSION

Scientists from the University of York have studied the indicators of success and difficulties associated with studying at psychological faculties. The indicators revealed a high level of neurotic disorders among students, as well as low self-esteem, which led to the impostor phenomenon. These factors complicate the path to the success of a person in the profession. Therefore, one can conclude about the importance of therapy for emotional trauma, including through art therapy. The results showed a significant positive influence of this method on psychology students [35]. Similarly, the scientists investigated the mental and emotional state of students and demonstrated the relevance of this issue. As for the differences, the experiment conducted at the University of York included not only art therapy but a comprehensive approach to psychological assistance.

In another experiment, scientists from Florida described and proved the effectiveness of art therapy in stress reduction among college students. The authors showed that art therapy is an effective and commercially available technique [36]. The similarity of the studies lies in the analysis of the influence of art technologies on the psychological state of students. The scientists from Florida, as well as the authors of this experiment, confirmed the positive dynamics of art therapy. Studies conducted in Croatia have found a positive effect of art on the centers of the right cerebral hemisphere. During the creative process, the right hemisphere activates additional neural connections, which are responsible for imagination, search for solutions, and synthesis, as well as for metaphorical thinking [37]. The experiment showed the practical effect of art therapy on human emotions, as shown in the current study. The differences concerned the research context: scientists from Croatia focused on neurobiology.

In the Netherlands, scientists agreed on the effectiveness of art therapy on anxiety. Experiments proved an increase in stress resistance and control of emotions [38]. The common feature of the experiments is the confirmed positive influence of art therapy on anxiety and stress resistance in both cases. Chinese author described an experiment aimed at treating depression through art therapy. Overall, the result was satisfactory. However, according to the conclusions of the scientists, there was a need for additional research [39]. The difference between the results of this study and the Chinese experiment may be due to the randomized type of research. The results do not claim to be accurate indicators.

Based on the experience of other researchers, the presence of art therapy in various spheres of life is essential. It allows people to reduce the influence of negative psychological factors that destroy personality. The difference between these data may be due to the areas of application of the methodology. However, both studies confirm this conclusion. Although the development of personal qualities through art therapy is not a fully studied topic, it is possible to discuss some results. According to the data from this study, art therapy relieves depression, anxiety, and emotional burnout. In addition, it increases stress tolerance and self-esteem. The survey of participants revealed that art therapy stabilized their emotional background and increased their motivation for self-development. Analyzing the presented paper, one can admit the effectiveness of art therapy techniques as a tool to combat various disorders (depression, anxiety, and burnout). Moreover, art therapy can foster self-development and help understand inner emotions. The obtained results suggest that art therapy allows participants to understand their problems. Due to good distracting and relaxing effects, art therapy also effectively regulates emotional background. Previous studies showed that this type of therapy develops the centers of the right cerebral hemisphere. Consequently, individuals improve their imagination, as well as their abilities to see prospects and solve problems that require a creative approach.

However, this study, like most others, is randomized. Therefore, there are some nuances regarding the accuracy of the results. For example, in this experiment, psychological problems were different for all participants in the group. The degree and severity of the problems also received insufficient attention. Most of the studies on this topic also conducted randomized experiments, which failed to address many aspects [38], [39]. Additional studies with more accurate focus groups can have more reliable results. Nevertheless, in terms of the successful development of an educational psychologist, art therapy proved to be an effective strategy. This technique can serve as an additional therapy for depression, generalized anxiety disorder, and emotional burnout. At the same time, in this study, the art therapy sessions involved a group of people with

knowledge in the field of psychology. Therefore, full-fledged art therapy may require additional individual consultations with a specialist in psychology.

The implementation of art therapy techniques can become a crucial component of educational policies aimed at supporting students' mental health. Educational institutions, including universities, colleges, and secondary schools, should consider integrating art therapy into their programs to create a supportive environment that fosters not only the academic but also the emotional development of students. This integration could involve regular art therapy sessions, specialized courses, or training for both teachers and students. Educational specialists should take these findings into account when developing and refining curricula. Investments in art therapy could become a significant part of strategies to reduce stress and burnout among students, which are key factors in enhancing the overall effectiveness of the educational system. The experience of using art therapy can be valuable in developing new approaches to education that address students' emotional needs and promote their holistic development. Therefore, the practical significance of the obtained results lies in the potential to improve the quality of education through the implementation of art therapy techniques, which will contribute to greater emotional stability and professional readiness of future specialists.

## 6. CONCLUSION

This study implemented art therapy in a focus group of students from the Department of Psychology and Pedagogy. The results of the experiment showed a decrease in the depression level by an average of 15%. The level of anxiety decreased by 20%, while a decrease in emotional burnout was by 15%. In turn, the indicators of stress resistance and self-esteem increased by 20% and 15%, respectively. Thus, therapy based on fine art reduced and regulated the level of negative emotions. In addition, the participants noted an increase in motivation for self-development and self-realization. This conclusion suggests the possible use of art therapy in many areas of life. For example, art technology therapy can serve as an additional strategy to reduce anxiety, depressive spectrum disorders, and emotional burnout. The technique can increase stress tolerance by regulating the release of stress neurotransmitters. Art therapy is also a widely used tool in the field of palliative care for terminally ill people. In the context of this study, this therapy can be an effective method for high school and university students. The methodology is highly valuable for this industry. By increasing motivation, art therapy helps people not only to balance their emotional state but also to decide on further development. This aspect is decisive in the education of future specialists in any field of activity. In the future, these specialists will make an invaluable contribution to the development of society.

However, there are very few studies with accurate results in this area. Therefore, there is an urgent need for additional study in the application of art technologies in this direction. It is necessary to conduct various group experiments with samples covering other target areas (for example, students of technical, medical, or humanitarian universities, as well as high school students). However, these participants may require additional individual sessions with an art therapy specialist. Another task is to differentiate research samples into subgroups according to the main psychological blocks and problems. An individualized study of a group with a predominance of depressive disorder, anxiety, emotional burnout, and increased perception of stress would present more accurate results. Accordingly, such studies must use a tailored therapy program and consider various nuances. An analysis of the data on people with low self-esteem would also present valuable conclusions. Further research can provide more resources for improving and creating new methods of art therapy. The current study did not collect data on the psychological state of the respondents after the experiment. There is a need for additional studies to clarify these findings.

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## AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

## CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

## INFORMED CONSENT

In this type of experiment, the consent of participants is mandatory. Therefore, all respondents received oral and written information about the conditions of the study. They also gave written consent to participate and compiled their profile forms.

## ETHICAL APPROVAL

The authors declare that the work is written with due consideration of ethical standards. The study was conducted in accordance with the ethical principles approved by the Ethics Committee of Makhambet Utemisov West Kazakhstan University (Protocol No 3569 of May 13, 2024).

## DATA AVAILABILITY

The authors confirm that the data supporting the findings of this study are available within the article [and/or its supplementary materials].




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