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Meditation Art Therapy: AIGC-Assisted Psychotherapy to Improve Anxiety in Retired People

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Abstract. This study aimed to explore the effect of artificial intelligence-generated artwork (AIGC) as an adjunct to mindfulness meditation on the improvement of anxiety symptoms in retired people. We recruited a group of retired people with anxiety symptoms and randomly divided them into two groups: the mindfulness meditation group (N=20) and the mindfulness meditation +AIGC group (N=20). The mindfulness meditation group received traditional mindfulness meditation training, while the mindfulness meditation +AIGC group used AI to generate paintings related to the meditation theme after the meditation. The results showed that AIGC-assisted mindfulness meditation significantly improved anxiety symptoms in retired people. After treatment, the average HAM-A score decreased to 19.65 (SD=4.84) in the AIGC group, while the meditation group also improved, with an average HAM-A score decreased to 20.55 (SD=1.43). Independent sample t test showed that the AIGC group had significant improvement in Anxious mood, Cognitive, Depressive mood, and Behavior at interview ($p<0.01$**), while the meditation group(Medi group) had no significant improvement ($p<0.05$*). The results of this study verified that AIGC in auxiliary applications can more significantly improve the mental health of the retired population, and is expected to provide a new treatment approach to improve the mental health of the retired population.

Keywords. Mindfulness meditation, AIGC, Psychotherapy, Retire, Anxiety

1. Introduction

Anxiety disorders are a common and widespread mental health condition that affects the quality of life of millions of people worldwide. Its causes exist in all aspects, spread across all age groups. Such as academic problems, employment problems, work pressure and life pressure. Among them, the retirement problem caused by the growth of age deserves our attention. While most retirees adjust relatively easily to the transition, some experience varying difficulties, manifested by decreased well-being and increased depressive symptoms [1]. van Solinge et al., through their study of adjustment and satisfaction in retirement, found that for some people, retirement can be a transition of increasing anxiety. Segel-Karpas et al. [2] proposed that retirement anxiety may lead to increased distress and decreased mental health, and it is important to understand how retirement perceptions affect the mental health of future retirees, and

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they found that the link between retirement anxiety and depressive symptoms is mediated by death anxiety. Anxious anticipation of retirement can mean that individuals see it as "over," leading to greater mortality salience and death anxiety, which is associated with poorer mental health. Anxiety disorders not only negatively affect an individual's physical and mental health, but may also interfere with their social life, career, and daily functioning. Research by Cara A Palmer et al. [3] proposes that trait anxiety increases vulnerability to the effects of sleep deprivation at the clinical and subclinical levels and across the developmental spectrum. In the face of these challenges, finding innovative treatments to reduce anxiety symptoms has become an urgent task. In previous studies, retirement counseling (RC) has attracted the attention of scholars. Younju et al. [4] found that "anxiety" is a major phenomenon in retirement by analyzing the RC report, and RC can effectively help people with retirement anxiety realize the necessity of retirement planning, alleviate psychological barriers, and enhance their determination to actively achieve goals. Mindfulness meditation, as an ancient practice, has attracted widespread attention in the field of mental health [5]. It emphasizes reducing anxiety, stress, and negative emotions through mindfulness and self-awareness. Previous studies have shown that positive meditation has a significant effect on depression, stress and anxiety symptoms [6], and may also help improve sleep quality [7], [8].

At the same time, digital art creation, as a form of creative expression, offers a unique avenue that enables individuals to translate emotions and experiences into visual works of art. The process of digital art creation itself may contribute to the expression and release of emotions, which can lower the professional threshold of art creation, improve the creativity and expression of users, and relieve the pressure of participants [9], [10]. However, no research has delved into whether combining mindfulness meditation and digital art creation can be more effective in reducing anxiety symptoms. In their research, Mark et al. [11] proposed to explore mindfulness as a form of education through artistic creation, and to apply the art of data visualization as an important link between art and self-inquiry. Therefore, the main question of this study is: Can the combination of mindfulness meditation and digital art creation significantly improve the psychological outcomes of patients with anxiety disorders? Our hypothesis is that this combined approach will provide more comprehensive anxiety relief, not only alleviating anxiety through the self-awareness of meditation, but also increasing therapeutic motivation and satisfaction through the emotional expression of digital art creation. This study aims to answer this question through empirical research and provide new insights and therapeutic approaches for the treatment of anxiety disorders. By exploring the combination of mindfulness meditation and digital art creation, we hope to provide patients with anxiety disorders with more effective psychotherapy methods and improve their quality of life, while also providing useful implications for future research in the field of psychotherapy and digital creation.

2. Related work

In the field of psychotherapy and anxiety relief, mindfulness meditation has gained a lot of attention and research. Mindfulness meditation is a practice based on focus and self-awareness that has been shown to produce positive effects for people with anxiety disorders. Past research has found that mindfulness meditation can reduce anxiety

levels, improve emotional regulation, increase life satisfaction, and positively affect the structure and function of the brain. In a study by John E. Lothes et al. [12], it was verified that mindfulness meditation may play a role in reducing anxiety and test anxiety. Akshya et al. Mindfulness meditation has also been used as a therapeutic method in combination with other different fields. For example, Gabriel et al. [13] used a controlled experiment to evaluate the reduction of stress, anxiety and depression by combining mindfulness meditation with aerobic exercise. Previous studies have also been conducted on the combination of digital art and mindfulness meditation. Graham and Lewis [11] argue that mindfulness, although often used as an intervention against school and teaching pressure, can also be considered a countercultural phenomenon and may lead to deeper personal understanding. Mindfulness as a form of education is explored through the practice of artistic creation. The artistic application of data visualization has become an important link between art and self-inquiry. The study of Kendra et al. [14] combined mindfulness and expression art to alleviate the psychological distress of cancer patients, allowing participants to find inspiration for artistic expression in mindfulness meditation, enabling them to express themselves in new ways.

Digital art creation provides a creative means of expression that can help individuals express their emotions and experiences. It has positive effects on emotional expression, psychological recovery and self-exploration. Neuroaesthetic research has shown that viewing artistic masterpieces can spontaneously trigger widespread brain arousal, also involving motor networks. In order to combine the meditative and performance advantages of art therapy programs, Roberto et al. [15] developed a virtual reality system in their study to improve the health status of patients with acute stroke by having participants undergo virtual art therapy. Artificial Intelligence Generative Art (AIGC), as an emerging technology, can generate visual art works based on emotion and theme, which provides a new creative tool for digital art creation. It can be widely used in creative fields and psychotherapy. AIGC can generate unique works of art based on user input, providing individuals with the opportunity to create and express. The potential value of this technology lies in its ability to stimulate creativity, emotional expression, and provide a positive emotional experience. Therefore, combining AIGC with mindfulness meditation may help to further improve treatment outcomes for anxiety patients, reduce anxiety through artistic creation, enhance self-awareness, and improve treatment engagement. These works can visualize the emotional state of the meditator, providing them with feedback and inspiration. From a design perspective, mindfulness meditation incorporating AIGC techniques should consider the core principles of meditation, such as mindfulness, self-awareness, and acceptance. Digital art should be generated in line with meditation themes and goals. In order to ensure the success of mindfulness meditation incorporating AIGC technology, user experience is critical. The user should feel an emotional connection with the generated digital artwork, which will enhance the effectiveness of the treatment.

3. Related work

3.1. Sample settings

In this study, we recruited 40 retirees from community and health care facilities through a platform promotion who met the following criteria: age 45 to 65 years and

met the diagnostic criteria for anxiety disorders in the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 5th Edition). Patients need to have good mental and cognitive function, no serious mental illness, such as schizophrenia, and no prior history of significant adverse reactions to mindfulness meditation or artistic creation. After recruitment, participants will be randomly divided into two groups: the mindfulness meditation group and the Mindfulness meditation +AIGC group. Basic information about the participants, such as age, gender, and education level, was recorded before the experiment. The experiments will take place in a research lab, providing a quiet and comfortable environment to support mindfulness meditation and digital art creation. The HAM-A scale will be assessed by four professionally trained medical staff to ensure accuracy and consistency. The meditation will be conducted under the guidance of an experienced meditation instructor who will guide participants to focus, improve self-awareness, and practice mindfulness. This study is approved by the Ethics Committee, other relevant information will be collected from families as appropriate, participants will voluntarily participate in this study according to their interests, and ethical principles including the protection of participants' privacy and obtaining informed consent will be strictly observed.

3.2. Anxiety assessment tool

The experiment used a standard anxiety assessment tool, the Hamilton Anxiety Scale (HAM-A), to measure the severity of anxiety symptoms. The scale consists of 14 items, including: 1. Anxious mood; 2. Tension; 3. Fears; 4. Insomnia; 5. Cognitive; 6. Depressed mood; 7. Somatic anxiety: Muscular; 8. Somatic anxiety: sensory symptoms; 9. Cardiovascular-symptoms; 10. Respiratory symptoms; 11. Gastro-intestinal symptoms; 12. Genito-urinary symptoms; 13. Autonomic symptoms; 14. Behavior at interview. The programs assessed the severity of different anxiety symptoms. Each item was scored based on the participants' responses on a scale of 0 to 56, with higher scores indicating more severe anxiety symptoms.Overall evaluation: (0-7 points, no anxiety or mild anxiety; 8-17 points, mild to moderate anxiety; Score 18-24, moderate to severe anxiety, score 24 or more, severe anxiety.) Participants' anxiety symptoms were followed up and assessed before and after the experiment. This will provide quantitative data that can be used to measure improvements in treatment outcomes.

3.3. Experiment process

A pre - and post-control experiment was used. Prior to the study, participants were given a baseline assessment, including the HAM-A assessment, and each participant's assessment score was recorded. The evaluation result was measured on a scale of 17 or more, and 40 retirees with significant anxiety symptoms were selected as participants. Participants will be randomly divided into two groups, the experimental group (AIGC group) of 20 and the control group (Medi group) of 20. Participants in the experimental group received the same mindfulness meditation training as those in the mindfulness meditation group. Practice mindfulness meditation twice a week for 30 minutes each time for 6 weeks. At the end of each meditation, participants will be asked to write a few words related to the content of their meditation, expressing their feelings, thoughts and emotions. Artificial Intelligence-generated Art (AIGC) technology is used to transform participants' text content into digital works of art. Each participant will

generate AIGC artwork several times, which will be collected during the study and used according to their ideas. Participants in the control group received traditional mindfulness meditation training and practiced mindfulness meditation twice a week for 30 minutes each time for six weeks. Anxiety symptoms were regularly assessed using the HAM-A scale before the start of the study, after the end of treatment, and at subsequent follow-up points.

3.4. Data analysis

Independent sample t test and analysis of variance were used to quantify the data and compare the results of anxiety symptoms between the two groups before and after the experiment to determine the significance of the treatment effect. Item statistical analysis of quantitative data was performed to gain insight into how participants improved in different aspects of the experiment.

Before the study began, all participants were assessed for their anxiety levels using an anxiety disorder assessment tool (the Hamilton Anxiety Scale). As shown in Table 1, the basic characteristics of the two groups of participants showed no significant differences in age, sex, education level and anxiety level (HAM-A) before the experiment.

Table 1. Characteristic of the two groups of participants

Characteristic	AIGC group (n=20)	Medi group (n=20)	t/X²	P
Age	55.5±7.49	55.30±6.31	-0.091	0.928
Gender (n,%)			0	1
Male	10 (50.0)	10 (50.0)		
Female	10 (50.0)	10 (50.0)		
Education Degree (n,%)			0.432	0.806
Junior high school and below	7 (35.0)	8 (40.0)		
Senior high school	10 (50.0)	8 (40.0)		
University and above	3 (15.0)	4 (20.0)		
HAM-A	24.25 ± 1.80	24.15 ± 1.57	-0.187	0.852

*ρ<0.05, **ρ<0.01, ***ρ<0.001

4. Results

After 6 weeks of meditation treatment, we obtained the statistics of changes in the anxiety level assessment scores of the two groups, as shown in Figure 1.

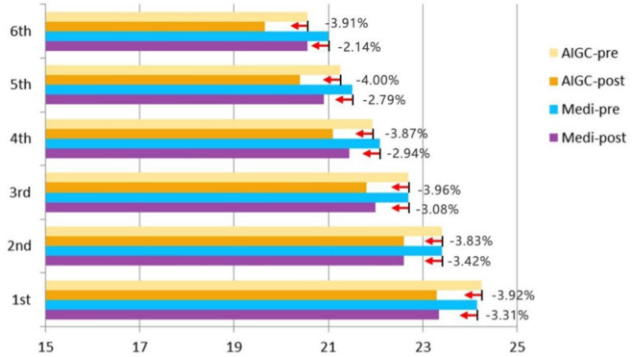

Figure 1. HAM-A scores for two groups before and after the six-week experiment.

The recording of some of the participants' artistic works and the presentation of written records are shown in Figure 2,3.

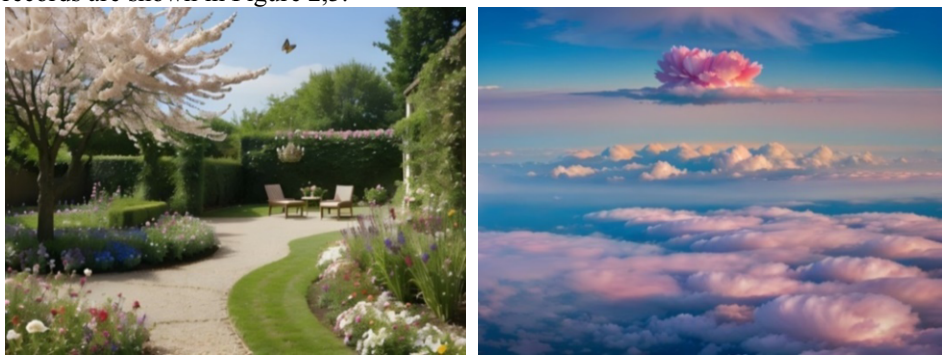

Figure 2. A beautiful garden with birdsong and butterflies (left) A flower blooming in the clouds and a colourful haze in the sky (right).

Figure 3. Sunset, vast grassland, a wooden house, a big tree (left) Desert ocean, a bright moon reflecting on the water (right).

See Figure 1. By comparing the data before and after the experiment, it can be found that both the experimental group and the control group have the effect of reducing anxiety, and the overall trend is decreasing with the increase of experiment times. However, the improvement degree of the two groups was different, the decline trend of the experimental group was more obvious, and the effect was stable, while the effect of the control group was no different from the experimental group in the early stage, but the effect gradually decreased and tended to slow down in the later stage. As shown in Figure 2,3, art therapy assisted by AIGC can help participants reproduce the meditation scene and present colorful images in a vivid and imaginative way. Each person's prompt words are different, and the resulting images are the same.

In order to more accurately evaluate the experimental effect of the two groups, SPSS statistical software was used to conduct statistical analysis on various data of the collected HAM-A scale, including calculating the mean and standard deviation, and analyzing the significance of anxiety improvement before and after the experiment of the two groups.

As shown in Table 2,3, the independent sample T-test and repeated measure ANOVA of HAM-A scores of participants in the two groups before and after the experiment were respectively obtained.

Table 2. HAM-A score independent sample t test

Item	AIGC group (n=20)		Medi group (n=20)		P t	
	pre-	post-	pre-	post-	AIGC pre/post	Medi pre/post
HAM-A scores	24.25 ± 1.80	19.65 ± 4.84	24.15 ± 1.57	20.55 ± 1.43	P=0.000*** t = 3.985	P=0.000*** t = 7.589

Table 3. T test analysis of HAM-A scale in two groups

Factor score	AIGC group n=20	Medi group n=20
Total points	22.475±2.41***	22.35±2.35***
1. Anxious mood	3.05±0.50(0.010)**	3.05±0.50(0.059)*
2. Tension	2.775±0.58(0.054)*	2.625±0.74(0.053)*
3. Fears	2.525±0.60(0.064)*	2.525±0.60(0.064)*
4. Insomnia	2.825±0.64(0.082)*	2.875±0.65(0.088)*
5. Cognitive	1.975±0.70(0.040)**	2.00±0.75(0.092)*
6. Depressed mood	2.75±0.63(0.043)**	2.85±0.66(0.055)*
7. Somatic anxiety: Muscular	0.625±0.54(0.774)	0.575±0.64(0.807)
8. Somatic anxiety: sensory	0.65±0.66(0.055)*	0.625±0.77(0.065)*
9. Cardiovascular-symptoms	0.10±0.30(1.000)	0.15±0.36(1.000)
10. Respiratory symptoms	0.10±0.30(1.000)	0.05±0.22(1.000)
11. gastro-intestinal symptoms	0.275±0.60(0.796)	0.3±0.65(1.000)
12. Genito-urinary symptoms	0.175±0.50(0.757)	0.15±0.48(1.000)
13. Autonomic symptoms	2.15±0.66(0.055)*	2.30±0.69(0.065)*
14. Behavior at interview	2.50±0.60(0.033)**	2.275±0.75(0.057)*

As can be seen from Table 2, the HAM-A score of the experimental group was significantly lower than that of the control group after the experiment, and the improvement effect was more significant (t=4.285, p<0.001**). In Table 3, by comparing the scores and total scores of each dimension factor of the HAM-A scale between the experimental group and the control group before and after the experiment, it can be found that the two groups have significantly improved the evaluation of the HAM-A scale, but their improvement effects and aspects are different. Among them, the experimental group, especially in anxiety mood, cognitive function, depressive mood and behavioral performance during talks, has a very significant improvement effect (***p <0.001), tension, fear, insomnia and autonomic symptoms also have a significant effect. The control group also showed improvement in anxiety, cognitive function, depressive mood, and interview behavior, but the effect was not as good as that of the experimental group (**p<0.01), and the improvement in other items was the same as that of the experimental group (p2,p4,<0.01, p3,p8,p13<0.05). Through interviews after the experiment, it was known that participants gained more sense of accomplishment and satisfaction during the process of generating AIGC artwork, which may also contribute to their therapeutic motivation and satisfaction. It can be seen that the creation of digital art works not only provides participants with a way to express their emotions and thoughts, but also enhances their active participation in therapy.

5. Discussion

This study revealed the effect of mindfulness meditation based on AIGC-assisted art therapy on anxiety symptoms in retired people. A controlled experiment was conducted to compare the intervention effects of participation in meditation art therapy and regular mindfulness meditation on the HAM-A scale score, and to assess its specific effects on different items of anxiety symptoms. The results of the study suggest that a combination of mindfulness meditation and digital artistic creation (AIGC) as a therapeutic approach shows significant results in reducing anxiety symptoms. Anxiety levels in the experimental group (mindfulness meditation +AIGC group) decreased significantly, while the control group (mindfulness meditation group) also improved slightly, but to a lesser extent. This finding highlights the unique advantages of combining AIGC technology with mindfulness meditation to increase the effectiveness of anxiety treatment. Mindfulness meditation provides participants with techniques for emotional regulation and self-awareness, while AIGC provides an avenue for more creative and emotional expression by generating digital works of art. AIGC technology plays a key role in the creation of digital art. It not only provides a novel creative tool, but also generates artistic content according to the emotional state of the participants, making the art work more emotionally resonant. This helps participants to translate their inner emotions and experiences into visual works, enhancing the effect of emotional expression. At the same time, mindfulness meditation provides individuals with training in emotional management, self-awareness, and focus, increasing their ability to participate in the creation of digital art. Therefore, mindfulness meditation combined with AIGC technology provides a comprehensive treatment approach that not only reduces symptoms, but also enhances the emotional experience and therapeutic motivation of participants. These findings are consistent with previous studies on the positive effects of art therapy on the mental health of anxious people [16], [17].

Despite the meaningful results of this study, there are some limitations that need to be considered. First, the sample size is relatively small, which may limit the generality of the results. Future studies could expand the sample size to test the efficacy of this treatment. Second, the study used short-term follow-up, and longer follow-up studies are needed to assess the durability of treatment effects. In addition, this study focused on the reduction of anxiety symptoms, and future research could explore the applicability of this approach to other mental health issues, such as depression or post-traumatic stress disorder, in greater depth. Another future research direction is to further optimize the application of AIGC technology to meet the needs of different individuals. Personalized digital art generation may improve therapeutic outcomes. In addition, research could also consider comparing different forms of digital art creation, such as painting, music, or virtual reality experiences, to see which form works best for different types of patients.

It can be seen that the combination of mindfulness meditation and digital art creation, especially the integration of AIGC technology, offers new prospects for anxiety treatment. Future research and innovation can further refine this therapeutic approach, while also opening up entirely new applications for psychotherapy and digital art.

6. Conclusion

The results of this study highlight the potential application of mindfulness meditation combined with digital art creation in anxiety relief, and aim to explore the application of combining mindfulness meditation and digital art creation, especially incorporating AIGC technology, in the treatment of anxiety disorders. Through a series of experiments and data analysis, we know that the combination of mindfulness meditation and digital art creation, especially with the help of AIGC technology, has a significant positive impact on the treatment of anxiety patients. After treatment, the participants' anxiety symptoms improved significantly, especially in the AIGC-assisted group. This suggests that this comprehensive treatment approach has potential for the relief of anxiety disorders and can be used as a powerful tool in clinical practice. This approach offers an innovative and beneficial therapeutic option that combines the emotional regulation and self-awareness techniques of mindfulness meditation with the expressive nature of digital art creation. The application of AIGC technology makes digital art creation more emotionally resonant, thus enhancing the therapeutic effect. This study provides valuable implications for clinical practice and research. Clinical psychologists and therapists have been encouraged to consider combining mindfulness meditation with digital art creation to improve the effectiveness of anxiety treatment. It calls for further in-depth research into different forms of digital art creation and personalized treatment methods to meet the needs of different patients. We look forward to future research and practice to further explore and develop this treatment approach to bring hope and recovery to more anxiety patients.

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