

ARTICLE

# Research on the Intervention Effect of Art-Making on the Anxiety Symptoms of College Students

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## ABSTRACT

This research was to investigate the intervention effect of art-making on the anxiety symptoms of college students. A sample of 400 college students took part in this research. They were assigned to the experiment group (n = 200) and the control group (n = 200) according to Self-Rating Anxiety Scale (SAS) scores. Unlike the control group, the experiment group received a standard art-making program under the supervision of trained instructors for a period of twelve sessions two times weekly which was continued for six weeks. Self-Rating Anxiety Scale (SAS) and Hamilton Anxiety Scale (HAMA) were used to assess anxiety symptoms level. Significant decreases in anxiety symptoms ( $p < 0.05$ ) were found in the experiment group compared with the control group. Using the art-making program to relieve anxiety, the shortest intervention period is three weeks. Art-making can effectively alleviate college students' anxiety, and also can effectively improve the physical health, mental health, and social health levels of college students.

## KEYWORDS

Art-making; anxiety symptoms; Self-Rating Anxiety Scale (SAS); Hamilton Anxiety Scale (HAMA); college students

## Introduction

Anxiety disorder, also known as anxiety neurosis, is a very common mental disease, mainly manifested as handshaking, sweating, palpitations, frequent urination, and other symptoms. Anxiety is an unpleasant and frightening emotional state, often accompanied by a range of physical activities, and various efforts to avoid threats and feelings of powerlessness towards those threats. Unlike fear, anxiety is an unpleasant experience of a potential or future threat. Anxiety is a more common psychological state, and individuals of different ages and different occupations have obvious differences in the degree and characteristics of anxiety [1,2]. Among them, college students have a special anxiety nature, and anxiety disorder has become one of the main psychological problems of college students. At present,

most studies believe that the mental health level of college students is lower than the national average level, among which anxiety disease is the mental disease with the highest detection rate and disability. Anxiety disease has seriously affected the mental health status of college students [3-7].

Since the 1950s, more and more scholars have begun to study the anxiety of normal people as a research object. To study anxiety levels more accurately, anxiety scales have emerged. At present, the commonly used anxiety assessment tools in China are the Hamilton Anxiety Scale (HAMA) [8], The Beck Anxiety Inventory (BAI), and the Self-Rating Anxiety Scale (SAS) [9]. In addition, specific scales based on anxiety types include: the Social Anxiety Scale, Social Avoidance and Distress Scale (SAD) [10], and Social Anxiety Disorder Scale (SADS) [11], and the classification of anxiety scales is becoming more and more detailed.



Self-Rating Anxiety Scale (SAS) is mainly used to evaluate the subjective feelings of anxious individuals, as a measure of the severity of anxiety state, and the change in the treatment [12]. SAS is a simple evaluation tool widely used to analyze the subjective anxiety symptoms of adults or adolescents. Through observation and analysis of depression and anxiety scale and psychological intervention in the treatment of the elderly depression status, anxiety status, and sleep quality of college students, Kejian et al. [13] implemented targeted emotional intervention, to reduce the probability of cardiovascular events. Previous studies have shown that baseball and softball can effectively improve people's mental state. Haidari et al. [14] studied the exercise of baseball and softball compared the intervention effect of sand game therapy, and used an anxiety scale and symptom self-evaluation scale to explore new ways to reduce social anxiety among college students. The intervention was effective, with the total score of social anxiety decreased and the total score of self-esteem increased. The results showed that baseball, softball, and sand games are effective in improving social anxiety among college students.

At present, many colleges attach great importance to the mental health problems of college students, and have set up psychological counseling rooms, equipped with psychological counseling teachers, carried out psychological counseling questionnaires, and conducted students' mental health screening. It should be said that these measures have played a good role in promoting the mental health of college students, and also play a certain role in troubleshooting the mental health risks of students [15,16]. However, according to that mental health is a more private one, the psychological development characteristics of college students make them shy in the face of these problems. When students have mental health problems, many people are difficult to speak about, or afraid to ask for help for fear of being regarded as psychological illness. This series of reasons make willingness to active counseling to help the teacher of college student very low, and the psychological counseling questionnaire also has certain limitations, even found some students appeared mental health problems, and through the way of direct intervention, students are resistant, and general problems also do not need to the degree of hospital treatment, but indulge and possibly serious consequences [17,18].

Psychological counseling of college students through the way of making art will reduce the chance of these problems [19]. Goodarzi described an 8-week intervention program for 16 female sexual assault victims in Iran aged 20–49 and investigated the positive effects of combining mindfulness and art-making on depression, anxiety, and shame in female Iranian sexual assault victims. Drake et al. [20] examined the influence of art-making in a sample of 44 undergraduate students. The findings suggest that coloring pre-drawn patterns may be useful as a stress reduction technique for university students. However, Art is known to be a tool that provides relaxation and helps therapy especially in psychiatric diseases and in many other health problems. Nazan et al. [21] was to ascertain if there is a difference in anxiety and depression symptom scores between students of conservatoire and other faculties. Whether drawing or

painting, students can make art in a more relaxed environment, compared with other types of art-making to appear lively and interesting. In art-making, people are pressured slowly, begin to relax, and even unconsciously express their potential psychological problems. Some psychologists let people with mental illness draw for this reason, painting can relieve their psychological pressure, and gradually recover their psychological health. Of course, if it reaches the extent of mental illness needs treatment, or should find a professional doctor for treatment, art-making plays an auxiliary and preventive role. The influence of art-making on college students' mental health is not the effect of standing up, but the need to be influenced in the long-term study.

To study the college students' art-making intervention method, this paper uses theoretical analysis, chooses the subject test to investigate the anxiety of college students, and designs the art-making program, to explore the effective intervention measures of college students' anxiety.

## Research Objects

### *Baseline data*

A total of 2600 students from the College of Art & Design and College of Civil Engineering at Nanjing Tech University were investigated for this research. A questionnaire survey and statistical analysis were performed using the Self-Rating Anxiety Scale (SAS), and a score greater than or equal to 50 means anxiety. Among 2600 students, 413 students indicated anxiety and the detection rate of anxiety problems among college students was about 15.9%, which matched the anxiety detection rate among college students in China [22]. According to the result of the investigation, 400 subjects with anxiety were expected to be observed in this experiment, including 200 in the experiment group and 200 in the control group. The subjects were grouped according to the random number table, to ensure that there was no significant difference between the two groups in age, gender, major, educational background, and physical condition as far as possible, and unlike the control group, the experiment group received the art-making program under the supervision of trained instructors.

### *Inclusion criteria*

The diagnostic criteria for anxiety disorders were met, and both students and their parents agreed to participate in this research and meet their needs. Among them: firstly, college students with SAS scores greater than or equal to 50 (with anxiety). Secondly, college students aged between 18 and 25. Thirdly, college students with clear consciousness, no language communication barriers, and those who can insist on art-making. Only after meeting the above three principles can they be included in this research.

### *Exclusion criteria*

Presence of other serious malignant lesions, or withdrawal from the investigator due to other factors, including: firstly, patients with a history of heart disease, major physical disease, organic brain disease, or other neurological disease. Secondly, who is taking or receiving any variety of

antipsychotics within 2 weeks prior to the start of this research? Any one of the above was excluded. Meanwhile, students with comorbid diseases such as depression, obsessive-compulsive disorder, and schizophrenia were not included in this research.

#### *Removal criteria*

Firstly, students with poor compliance and failed to follow the requirements. Secondly, participation in art-making programs was incomplete, and more than 20% of programs were absent. Any one of the above was removed.

#### *Informed consent*

The informed consent form was developed in this research, and all subjects had to carefully read and sign the informed consent form before entering the experiment. This research guarantees each subject the right to participate and give informed consent.

#### **Test Process**

##### *Test method*

The art-making intervention started in 2009 as a way for patients undergoing BMT to reflect on the cancer experience using art. Patients were able to paint as many times as they desired during treatment at the BMT clinic [23]. In this study, participants were provided with art creation tools such as brushes, easels, and drawing papers to create an A4-sized simple stroke in the laboratory. Trained teachers provided explanations on the specific requirements for simple strokes, with participants drawing freely for 60 min each time. After the painting was completed, it was anonymously displayed in the one-stop student community of Nanjing Tech University or donated to local elementary school students.

The control group participated in typical activities during the experiment, such as watching television, talking with instructors, and using computers. Control group participants were asked to not engage in art-making for the study period. In terms of trained instructors, they should maintain a kind attitude, pay more attention to their own behavior, maintain a kind attitude to communicate with students and maintain a warm and sincere attitude toward students, so as to achieve the purpose of promoting the distance between instructors and students. In the process of experiment, students should be given a warm and comfortable environment based on the characteristics of open laboratory management. In the layout of the laboratory environment, humanization should be the main perspective, such as hanging landscape paintings and placing plant bonsai in the laboratory, so that students can feel the warm and free atmosphere.

##### *Implementation process*

This experiment was performed from September 01 to October 12, 2022. For data detection, a total of three experimental data collection was in each subject, respectively, one week before the experiment (August 25, 2022, pretest), experimental intervention after three weeks (September 22, 2022, middle test), and one week after the experiment (October 19, post-test). The main content in this

experiment was the Self-Rating Anxiety Scale (SAS) and Hamilton Anxiety Scale (HAMA), and the time interval and content of data between the experiment and control groups were the same.

In terms of experimental intervention, the experiment group intervened in the art-making program. The art-making intervention was arranged two times a week, sixty minutes each time, for a total of six weeks, and the control group had no intervention measures. Before the beginning of the experiment, the instructors explained the various precautions to the subjects and instructed the subjects to fill in the SAS and HAMA scales. Each subject collected the experimental data a total of three times, with time nodes: one week before the experiment started, three weeks after the experimental intervention, and one week after the experimental intervention. The control group did not intervene in art-making and also filled the SAS and HAMA scales in the laboratory one week before the experiment, three weeks after the experimental intervention, and one week after the experimental intervention.

##### *Detection index*

In order to test the intervention effect of art-making, the indicators between groups (experiment group and control group) were compared and analyzed: Self-Rating Anxiety Scale, Hamilton Anxiety Scale, and satisfaction with the current relevant art-making programs.

Among them, the Self-Rating Anxiety Scale is a statistical table reflecting the anxiety degree and change with high reliability and validity. The Cronbach coefficient for this scale is 0.724. The SAS is mainly used to assess the frequency of symptoms, and the final statistical index is the total score. In China, SAS score below 50 is in the normal emotional range, and SAS score above 50 indicates anxiety, among which anxiety is divided into three levels, namely mild anxiety (50–59 points), moderate anxiety (60–69 points), and severe anxiety (above 70 points).

Besides, the Hamilton Anxiety Scale was prepared by Hamilton in 1959. The CCMD-3 Chinese Diagnostic Criteria for Mental Diseases lists it as an important diagnostic tool for anxiety disorders. The HAMA total score can better reflect the severity of anxiety symptoms. The total score can be used to evaluate the severity of anxiety symptoms and to evaluate the effect of various drugs, and psychological interventions in patients with anxiety and depressive disorders. According to the information provided by China Scale Cooperation Group, anxiety is divided into five levels, respectively serious anxiety (total score greater than or equal to 29), obvious anxiety (total score greater than or equal to 21 but less than 29), anxiety (total score greater than or equal to 14 but less than 21), possibly anxiety (total score greater than or equal to 7 but less than 14) and no anxiety (total score less than 7).

##### *Statistical analysis*

SAS and HAMA extracted the total score of the scale, and this research implemented SPSS 26.0 statistical software to analyze the results and data of this study, where the Self-Rating Anxiety Scale and Hamilton Anxiety Scale were tested by measurement data and the T value of independent samples.

The satisfaction of the test students with the art-making programs was tested by count data and chi-square value test. If the difference between 2 groups was significant,  $p < 0.05$  was used to show the difference.

### Control during the Experiment

People's psychological behavior is very complex and will be affected by the subjective and objective factors evaluated. Some external irrelevant factors, such as external sounds, room facilities, etc., will affect test results. Therefore, the internal and external irrelevant factors must be eliminated in the experiment, and in order to make the test objective and accurate, the tester must be specially trained, fully familiar with the process, content, and method of the test, and be able to implement the test in strict accordance with the experimental procedures.

Firstly, carefully choose test scales: any test scale has its purpose of application, the scope of application, and has a certain reliability and validity. In this experiment, this paper selected the SAS and HAMA scales as the measurement scale of each test.

Secondly, establish a harmonious relationship with the experimenter: If this relationship is not quite coordinated, there may be two situations that affect the test: one is to make the subject produce "impedance" to the experiment, not cooperation, one is the experimenter appears "test anxiety", so that the test score can not reach the level. Only in a well-coordinated relationship can the experimenter best perform his response to the experiment.

Thirdly, control the error of the implementation experiment: in the process of the implementation experiment, due to the influence of subjective and objective factors, some errors may appear. In order to make the experimental results accurate, the error must be controlled as far as possible. Therefore, the operation of the experimenter in the experimental process should be carried out in strict accordance with the provisions and requirements of the experiment and be good at stabilizing the emotions of the experimenter, and grasp other relevant points of attention, so that the experimenter is willing to give full play to all the ability or show other characteristics.

Fourthly, correctly interpret experimental results: each standardized experiment, often with numerical values to express its results, and the experimental value is only a

relative value. Therefore, in general, such results should not be told to experimenters or their families, but only to the interpretation of the experimental results.

### Experimental Results

#### General data of the test subjects

A total of 400 anxious college students who met the inclusion criteria and exclusion criteria were recruited, including 200 in the experiment group and 200 in the control group. The ratio of gender, age, educational background, and major of the experiment group and control group was analyzed by the chi-square test of the four-grid table data in the statistical analysis, and the results showed that there was no statistical difference between the two groups ( $p > 0.05$ ). This shows that there was no statistical difference in the gender, age, educational background, and major of the experiment group and control group, and the basic level of the two groups was consistent, also two groups were comparable. See [Table 1](#) for details.

The final subjects of this trial were determined. The experiment group (200 cases): 103 males and 97 females, 145 undergraduate students and 55 graduate students, 67 students from the College of Art & Design and 133 students from the College of Civil Engineering, aged between 19–23 years, with an average of  $(21.11 \pm 1.32)$  years. The control group (200 cases): 101 males and 99 females, 152 undergraduate students and 48 graduate students, 73 students from the College of Art & Design and 127 students from the College of Civil Engineering, aged between 19–23 years, with an average of  $(21.97 \pm 1.85)$  years. There was no statistical difference between the two groups ( $p > 0.05$ ).

#### Results of the anxiety self-rating scale (SAS)

For the experiment group, in the pretest, the mean SAS score of 200 test subjects was  $53.48 \pm 4.47$ . In the middle test, the mean SAS scores of 200 test subjects were  $48.13 \pm 5.57$ . Among them, there were 39 cases (7 males and 32 females) with different degrees of depressive symptoms, accounting for 19.5% of test subjects, and there was a significant difference between males and females ( $p < 0.05$ ). In the post-test, the mean SAS scores of 200 test subjects was  $42.37 \pm 5.52$ . However, for the control group, in the pretest, the mean SAS score of 200 test subjects was  $54.82 \pm 4.68$ , and

TABLE 1

Gender, age, educational background and major comparisons between experiment and control groups ( $\bar{X} \pm S$ )

Category	Experiment group (n = 200)	Control group (n = 200)	<i>p</i>
Gender	Male	103	101
	Female	97	99
Educational background	Undergraduate student	145	152
	Graduate student	55	48
Major	Art & design	67	73
	Civil engineering	133	127
Age	$21.11 \pm 1.32$	$21.97 \pm 1.85$	0.53

TABLE 2

SAS scores between experiment and control groups ( $\bar{X} \pm S$ )

Category	n	Pretest	Middle test	Post-test	p
Experiment group	200	53.48 ± 4.47	48.13 ± 5.57	42.37 ± 5.52	0.00**
Control group	200	54.82 ± 4.68	53.67 ± 5.34	53.86 ± 5.23	0.46

Note: \*\* $p < 0.01$ .

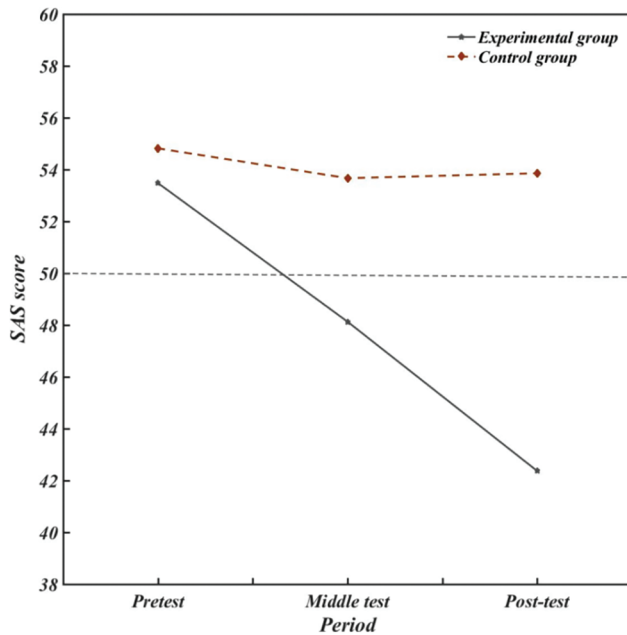


FIGURE 1. Comparison of SAS scores between experiment and control groups.

there was no obvious difference from the pretest to the post-test ( $p > 0.05$ ).

The analysis results of the SAS test with independent samples showed no statistical difference between the two groups ( $t = -1.00, p > 0.05$ ). The SAS score results are shown in Table 2 and Fig. 1. Further simple effect analysis showed that in the overall comparison, three SAS scores of the experiment group were extremely different ( $F = 114.35, p < 0.01$ ), and the SAS scores of the middle test and post-test were also lower than that of the pretest, and the comparison was statistically different ( $p < 0.01$ ). There was no statistical difference in the three SAS scores in the control group ( $F = 0.74, p > 0.05$ ). In terms of comparison between the two groups, the SAS scores of the experiment group were lower than those of the control group, and there were statistical differences between the two groups ( $F = 23.50, p < 0.01, F = 121.79, p < 0.01$ ).

Hamilton anxiety scale (HAMA)

For the experiment group, in the pretest, the mean HAMA score of 200 test subjects was  $17.16 \pm 1.78$ . In the middle test, the mean SAS scores of 200 test subjects was  $12.13 \pm 1.67$ . In the post-test, the mean SAS scores of 200 test subjects was  $7.37 \pm 1.54$ . However, for the control group, the mean SAS score of 200 test subjects was  $16.88 \pm 1.47$  in the pretest, and there was also no obvious difference from the pretest to the post-test ( $p > 0.05$ ).

TABLE 3

HAMA scores between experiment and control groups ( $\bar{X} \pm S$ )

Category	n	Pre-test	Middle test	Post-test	p
Experiment group	200	17.16 ± 1.78	12.13 ± 1.67	7.37 ± 1.54	0.03
Control group	200	16.88 ± 1.47	16.67 ± 1.32	15.86 ± 1.23	0.06

For the experiment group, HAMA total scores were statistically different before and after testing ( $p < 0.05$ ). The SAS score results are shown in Table 3 and Fig. 2. Further simple effect analysis showed that in the overall comparison, three HAMA scores of the experiment group were statistically different ( $t = -2.40, p < 0.05$ ), and the HAMA scores of the middle and post-test groups were also lower than that of the pretest, and the comparison was statistically different ( $p < 0.05$ ). There was no statistical difference in the three HAMA scores in the control group ( $t = -2.42, p > 0.05$ ).

Results of students' satisfaction with aesthetic education courses  
Students' satisfaction with art-making programs during the same period was tested by count data and chi-square value.

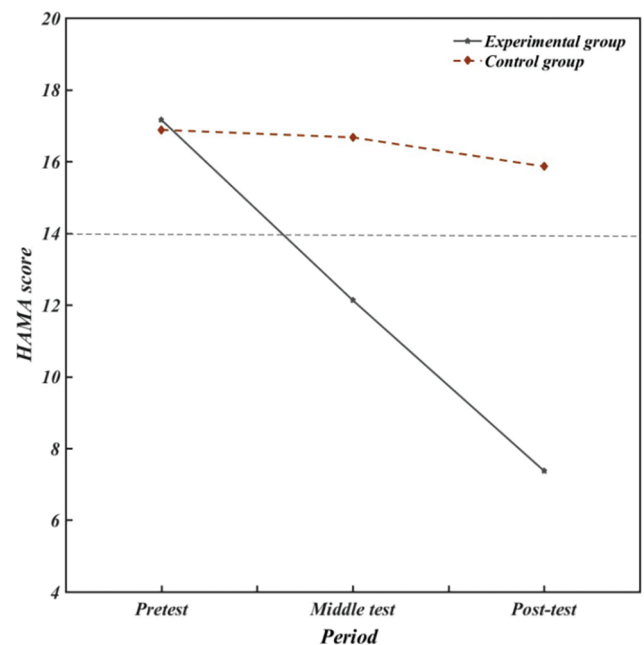


FIGURE 2. Comparison of HAMA scores between experiment and control groups.



TABLE 4

400 students' satisfaction with art-making programs in the same period (n, %)

Category	n	Satisfied	General satisfied	Unsatisfied	Total satisfaction (%)
Experiment group	200	127	66	7	96.50
Control group	200	83	59	58	71.00

The satisfaction of 200 students in the experiment group was higher than that of the control group, and the difference between the two groups was significant ( $p < 0.05$ ), which is shown in Table 4.

### Discussion and Analysis

Anxiety Self-Rating Scale (SAS) is a statistical table with high reliability and validity, which can reflect anxiety degree and change. A total score below 50 is in the normal mood range, and a total score above 50 indicates anxiety. The higher the total score, the heavier the anxiety degree. The statistical results of the SAS total score are discussed and analyzed below. The statistical results show that the anxiety state of the experiment group and control group was at the same level before the intervention in art-making, which indicates that the two groups are comparable.

Through the six-week intervention of art-making, the SAS score of the experiment group decreased from  $53.48 \pm 4.47$  to  $42.37 \pm 5.52$ , which was stable within the normal range. The comparison of the SAS scores between the pretest and the middle test was statistically different, and the SAS score was below 50 ( $48.13 \pm 5.57$ ) in the middle test, indicating that the intervention of art-making can effectively relieve anxiety within three weeks. In the control group, the SAS scores decreased from  $54.82 \pm 4.68$  to  $53.86 \pm 5.23$  with no statistical difference, and the subjects in the control group were still within the range of anxiety state, indicating that there was no significant change in anxiety in the subjects who received no any other intervention.

Hamilton Anxiety Scale was one of the earliest scales commonly used in the psychiatric clinic and included 14 items. The statistical results showed that the anxiety state of the experiment and control groups was at the same level before the intervention of art-making, indicating that the two groups were comparable. Through a six-week intervention in art-making, the HAMA score in the experiment group decreased from  $17.16 \pm 1.78$  to  $7.37 \pm 1.54$ , stable within the normal range. The comparison of HAMA scores between the pretest and middle test was significantly different, and the HAMA score in the middle test was lower than 14 ( $12.13 \pm 1.67$ ), indicating that art-making intervention could effectively relieve anxiety within 3 weeks. In the control group, the HAMA scores decreased from  $16.88 \pm 1.47$  to  $15.86 \pm 1.23$ . The test results of HAMA agree with SAS, indicating that the test results are credible.

It can be seen that the intervention of art-making can effectively relieve the anxiety of college students, and the

intervention can significantly relieve the anxiety within 3 weeks.

The total satisfaction of the experiment group reached 96.5%, while the total satisfaction of the control group was only 71%, so the former was higher which can be seen that students are relatively satisfied with the art-making programs which were specially offered to students. But it also found some problems in the process of investigation, for the art-making programs mostly stay on the surface of aesthetic discipline with no in-depth interpretation. Currently, the art-making programs are relatively single, which are needed to further enrich in the future, to purify students' minds.

### Conclusion

This research for anxiety college students, using SAS, HAMA, and satisfaction as a detection index three times data analysis (respectively pretest, middle test, and post-test), verifies that six-week art-making program intervention can effectively regulate and alleviate college students' anxiety, concluded as follows: (1) The art-making programs can effectively alleviate college students' anxiety. (2) The art-making programs can effectively improve the physical health, mental health, and social health levels of college students. (3) Using art-making programs to relieve anxiety, the shortest intervention period is three weeks. However, there are many forms of art-making programs, in addition to painting in this research, the intervention effect of other forms of art-making programs on anxiety symptoms deserves further study. To sum up, the intervention effect of art-making programs in anxiety patients is very significant, and it can improve their anxiety and depression, which is worthy of further promotion and exploration.

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**Availability of Data and Materials:** All data generated or analyzed during this study are included in this published article.

**Ethics Approval:** Ethics Committee approval was obtained from the Institutional Ethics Committee of Nanjing Tech University to the commencement of the study. All participants have signed informed consent in this study.

**Conflicts of Interest:** The authors declare that they have no conflicts of interest to report regarding the present research.

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