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# The Effect of Meditation on Life Satisfaction - A Randomized Controlled Trial from Patients with Major Depressive Disorder

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## Abstract

**Objective:** Major Depressive Disorder (MDD) is a relatively common mental disorder in clinical practice, often accompanied by symptoms such as persistent depressed mood, diminished interest, pessimism, and the feeling that every day of living is an agony.

**Methods:** Participants were randomly selected among patients with major depression to participate in the experiment, and participants were randomly assigned to the experimental group (meditation group), the control group, and the experimental group (meditation + medication group). The experimental group (meditation group) and the experimental group (meditation + medication group) participated in a 2-month meditation training, and the control group watched a movie for the same amount of time. Measures of the experimental effects included the Digit Symbol Substitution Test (DSST) and the Satisfaction with Life (SWL) test.

**Results:** The SWLS, DSST scores of the experimental group (meditation + medication group) were significantly higher than those of the experimental group (meditation group) (t=-9.596, p<0.01; t=-12.19, p<0.01).

**Conclusion:** Meditation training can effectively improve the Information Processing Speed (IPS) and Satisfaction With Life (SWL) in patients with major depression, and the combination of meditation training and medication has a more obvious effect on the treatment of depression.

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**Keywords:** Meditation; Satisfaction with life; Major depressive disorder.

## Introduction

Major Depressive Disorder (MDD) is a common mood disorder in psychiatric clinics, characterized by patients' loss of interest in daily activities, often accompanied by changes in sleep and appetite, sadness, and suicidal tendency, often accompanied by cognitive dysfunction, and is a disabling psychiatric disorder that affects roughly one-fifth of the world's population [1]. By 2020, depression has rapidly become the second most prevalent disease in humans globally after cardiovascular disease [2,3]. Posing a significant challenge to the health sector [4-6]. There are significantly direct and indirect impacts on individuals and society [7]. Major Depressive Disorder (MDD) usually has its first onset during adolescence [8]. And is closely related to the incidence of mental illness, suicide rate and dementia in adulthood [9-11]. Therefore, the prevention and intervention of adolescent depression is very important. In our clinical practice, adolescent depression interventions mainly include medication and psychological interventions, but these therapies have a long period of time, high side effects, and are not always effective, and there may be some side effects during the treatment process, so depression treatments are often faced with the dilemma of relapse after healing.

A large amount of literature demonstrates that meditation, as an ancient technique of adjusting physical and mental exercise, can increase monoamine levels, enhance parasympathetic nerve activity, improve antioxidant enzyme activity, and

has been introduced to treat various mental disorders caused by excessive stress [12]. Meditation training can help individuals to relax and reduce extraneous thought processes, thereby relieving life stress, stabilizing emotions, and improving concentration [13,14] and decreasing anxiety, depression, fatigue, frustration, helplessness, and aggression in individuals [15-17] reduces self-denial and suicidal tendencies, helps patients become aware of ways to adapt and cope with stressful psychosocial environments, and improves overall quality of life [18]. Most researchers believe that meditation training is effective in treating depression [19]. A study of incarcerated adolescents who participated in a 10-week meditation training to reduce their stress showed significant enhancements in self-regulation, life satisfaction, self-awareness, and social cohesion [20,21]. Individuals who received meditation training were able to quickly shift their attention from one goal to a new one [22] indirectly indicating a significant improvement in the Information Processing Speed (IPS) of the experimental participants.

However, there are relatively few empirical studies in academia on meditation training and the treatment of depression, and the research has not progressed far enough. Kim et al. selected 256 college student participants to undergo a 15-week meditation training program, and a questionnaire was administered once in the first and once in the last course to collect information on six indicators of psychological well-being for each participant [23]. The results of the experiment indicated that positive thinking meditation was associated with improvements in adult ADHD scores and self-identity among college students, with the shortcoming that it did not detail how much of an impact meditation training had on mental health and what mental health indicators were improved by meditation training. Tania et al used positive thinking Meditation Training in Cognitive Therapy (MBCT) with patients with bipolar disorder over the course of 12 months of ongoing Clinicians assessed anxiety, depression, and stress symptoms in patients with bipolar disorder and found a correlation between meditation training and patients' depressive symptoms [24]. The results showed a correlation between meditation training and symptoms of depressed patients, but did not study whether meditation training had a significant effect on the treatment of depression, nor did it provide data proving whether meditation training positively or negatively affected patients' depression levels. Reyes et al studied the relationship between self-rated health status and depressive mood in elderly Costa Ricans, and the mediating role of life satisfaction between self-rated health status and depressive mood. A longitudinal study of Costa Rican Longevity and Healthy Aging Study subjects measured self-rated health status, depressed mood, and life satisfaction prior to the study, and then reassessed depressed mood 18 months later, which showed that self-rated health was negatively correlated with depressed mood, and the researchers proposed a way to prevent depressed mood by increasing life satisfaction [25]. The shortcoming of the study is that the researchers did not further validate the reliability of this idea. Viguer et al. studied alleviating depressive mood and improving participants' life satisfaction and mental health through survey-based reminiscence interventions. 160 healthy elderly people participated in a 10-session survey-based reminiscence intervention experiment. The experiment designed pre-experimental assessment and post-experimental assessment to compare the results of the control group and the experimental group to observe the experimental effect. The results of the experiment showed that the life satisfaction and psychological well-being of the participants in the experimental group were significantly improved, and depressive mood decreased, but the improvement in depressive mood was not significant [26]. Although the results did not meet expectations, this study provided some support for effective intervention measures to improve the life satisfaction of the elderly. Follow-up researchers can conduct in-depth research on this basis.

Overall, there are relatively few research results on the relationship between meditation and life satisfaction at home and abroad at present, and relevant empirical research is lacking. In order to better verify the experimental effect, we chose patients with major depressive disorder as the research object, to verify whether the meditation training can be beneficial to improve the rehabilitation effect of patients with major depression, as well as to compare the experimental group (meditation group) and the experimental group (meditation + medication group) whether there is a difference in treatment effect, and to explore whether there is a difference in treatment effect of the experimental group (meditation group) and the experimental group (meditation + medication group). treatment effects, to explore a more suitable treatment method for psychiatrists to treat depression, and to improve patients' life satisfaction.

## Methods

### Participants

All participants (N=435) were patients with major depression who had been diagnosed by the psychiatry department of the hospital, we recruited the experimental participants from Anhui Normal University, all participants understood the purpose and methodology of the experiment, and all of them voluntarily took part in this experimental program, and at the same time, the written informed consent was obtained from their guardians, and at the end of the experiment, we issued a subsidy for each participant. Finally, we randomly assigned the participants to the experimental group (Meditation group), experimental group (Meditation + medication group), and the control group, with 145 participants in each group. All participants had no experience with meditation training courses, and no participants in the experimental group (meditation group) or control group received depression medication or counseling services during this experiment, and participants in the experimental group (meditation + medication group) adhered to one tablet of the antidepressant drug alprazolam daily.

The Ethics Committee of Anhui Normal University approved the project, and after fully explaining the purpose and methodology of the experiment, all participants involved in the experiment were willing to join the program.

## Research methods

All participants in this experiment were patients with major depression who had been diagnosed by the psychiatric department of the hospital, and all participants were randomly and equally assigned to the experimental group (meditation group), experimental group (meditation + medication group) and control group. Among them, the experimental group (meditation + medication group) consisted of 145 participants (average age: 19 years, 80 males and 65 females) who were required to complete a total of 56 meditation training sessions (duration 2 hrs/session) for 2 months and to take one capsule of the antidepressant medication, alprazolam tablets, every day during the experimental period. The experimental group (meditation group) consisted of 145 participants (mean age: 20 years, 80

males and 65 females), who were required to complete a total of 56 (duration of 2 hrs/session) meditation training sessions for 2 months during the experimental period. The meditation trainer in charge of the experiment was a counselor with 10 years of working experience and rich experience in teaching meditation training. Before the first 4 weeks of training, he would teach the steps and techniques of meditation, then play soft music to guide people to focus on their breathing and slowly relax their bodies. After 1 month of training, the meditation trainer asked the participants in the experimental group (the meditation group) to stop focusing on their breathing and to feel the smallest changes in every part of their body at will.

The control group, consisting of 145 participants (average age: 20 years, 80 males and 65 females), watched a movie during the experiment conducted by participants in the experimental group (meditation + medication group) and the experimental group (meditation group).

All participants in the experimental group (meditation group), experimental group (meditation + medication group) and control group took part in two tests before and after the experiment, which consisted of the Digit Symbol Substitution Test (DSST) and Satisfaction with Life Scale (SWLS) tests, and the tests were conducted in an anonymous form. The first test of the experimental group (meditation group) and the experimental group (meditation + medication group) was scheduled within 1 week before the meditation training, and the second test of the experimental group (meditation group) and the experimental group (meditation + medication group) was scheduled within 1 week after the meditation experiment. Participants in the control group were synchronized with the two tests in the experimental group (meditation group). The research procedure for this experiment is as follows Figure 1.

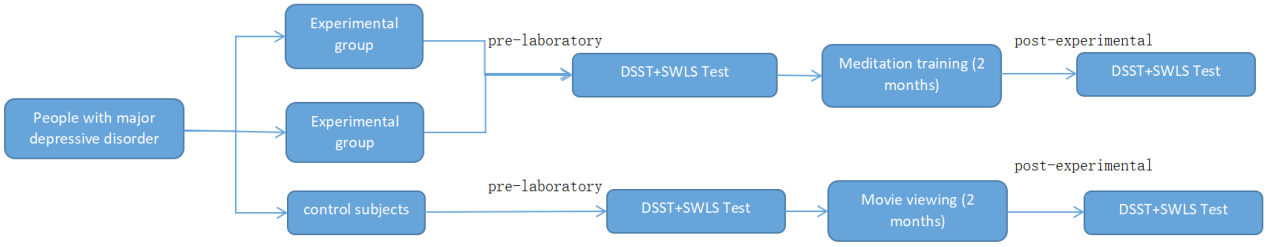


**Figure 1:** Flow chart of the experimental study.

### Outcome measures

**Digit Symbol Substitution Test (DSST):** The Digit Symbol Substitution Test (DSST) can well identify patients with cognitive impairment. Such individuals have impairments in memory and visual search, so their Information Processing Speed (IPS) is relatively slower than ordinary individuals [27]. The Digit Symbol Substitution Test (DSST) consists of 9 numbers and corresponding symbols, and the formal test form consists of 10 simulated test data and 90 formal test data. The experimenter placed the test form in front of the subjects and informed the experimental participants that the numbers 1-9 corresponded to 9 different symbols, and asked them to fill in the symbols corresponding to them according to the numbers in the pattern test form behind them, and after completing the first 3 number tests in the simulation form, the participants could complete the next 7 number tests in the form by themselves, and then stop the simulation test mentioned above. After the experimenter gave the instruction to start the test formally, the experimental participant needed to complete the next 90 numerical tests within 90 seconds. 10 analog test data results were not scored, and each of the 90 formal test data was scored as 1 point for each correct answer filled in by the participant, and the inverted symbols were scored as 0.5 points, with the maximum score of the whole questionnaire being 90 points. Higher scores indicate higher levels of cognitive ability and memory and faster Information Processing Speed (IPS) for experimental participants.

Rothschild confirmed that meditation training is effective in improving Information Processing Speed (IPS) and quality of life [28]. The Digit Symbol Substitution Test (DSST) requires experimental participants personnel to selectively pay attention to symbols and paired numbers that need to be processed quickly, and working memory for the accuracy of the test task, which is a good information processing measurement tool [29]. Therefore, the Digit Symbol Substitution Test (DSST) was chosen as the primary outcome measurement tool for this study.

**Satisfaction with Life Scale (SWLS):** The Satisfaction with Life Scale (SWLS) developed by Diener and Pavot has passed cross-cultural tests and is applicable to different cultural groups around the world, making it a commonly used life satisfaction measurement tool internationally. The scale consists of five items and is based on a 7-point Likert scale in which participants answer 1-7 for strongly disagree, disagree, largely disagree, neutral, largely agree, agree, and strongly agree, respectively, and the five item scores are added together to obtain the total score of the Life Satisfaction Scale. Higher scores indicate that the experimental participants are more satisfied with their lives. Specifically, scale scores ranging from 5-9 indicate very dissatisfied with life, scale scores ranging from 10-14 indicate dissatisfied with life, scale scores ranging from 15-19 indicate mostly dissatisfied with life, scale scores ranging from 20 indicate moderately satisfied with life, scale scores ranging from 21-25 indicate mostly satisfied with life, scale scores ranging from 26-30 indicate satisfied with life, and scale scores between 31-35 indicating very satisfied with life.

### Data analysis

Data were analyzed using SPSS Statistics 25 statistical analysis system software. Differences in Information Processing Speed (IPS) between the experimental group (meditation group) and the control were expressed as mean, Standard Deviation (SD), Tests for differences between categorical parameters were based on Pearson's chi-square test and post-hoc multiple comparisons Fisher's test. All tests applied were two-tailed and p-value of less than or equal to 0.05 was considered a significant difference.

## Results

The mean baseline SWLS score for the experimental group (meditation group) is 14.779, and for the control group it is 14.821. There is no significant difference between the scores

of the experimental group (meditation group) and the control group (t=-0.636, p>0.05). The experimental group (meditation + medication group) is 14.717 and there is no significant difference between the scores of the experimental group (meditation group) and the experimental group (meditation + medication group) (t=0.395, p>0.05). After the participants in both groups completed the 2-month meditation training course or the movie watching activity experiment, respectively, the SWLS score of the experimental group (meditation group) is 29.200, which shows a significant change from the baseline score (t=-181.826, p<0.01), whereas the control group's SWLS score is 14.828, which does not show a significant change from the baseline (t=-0.101, p>0.05). There is no significant difference in SWLS score between experimental group (meditation group) pre-experiment and control group post experiment (t=0.660, p>0.05), while there is significant difference in SWLS score between control group pre-experiment and experimental group (meditation group) post experiment (t=-192.473, p<0.01). The post-experimental score of the experimental group (meditation + medication group) is 30.517, which is higher than the post-experimental score of the experimental group (meditation group) and there is a significant difference between the two (t=-9.596, p<0.01). In summary, without significant difference in the pre-experimental data, the experimental group (meditation + medication group) has a substantial increase in SWLS score and a significant increase in the level of life satisfaction after the intervention through the combination therapy.

The mean baseline DSST score of the experimental group (meditation group) is 35.697, while that of the control group is 35.731. There is no significant difference between the scores of the two groups (t=-0.395, p>0.05). The experimental group (meditation + medication group) is 76.959 and there is no significant difference between the scores of the experimental group (meditation group) and the experimental group (meditation + medication group) (t=0.457, p>0.05). After the participants in both groups completed the 2-month meditation training course or the movie watching activity experiment respectively, the DSST score of the experimental group (meditation group) is 76.959, which shows a significant change from the baseline score (t=-357.570, p<0.01), whereas the DSST score of the control group is 35.682, which does not show a significant change from the baseline (t=-0.540, p>0.05). The post-experimental score of 80.076 in the experimental group (meditation + medication group) is higher than the post-experimental score of the experimental group (meditation group) and there is a significant difference between the two (t=-12.197, p<0.01). There is no significant difference between the DSST scores of the experimental group (meditation group) before the experiment and the control group after the experiment (t=-0.140, p>0.05) and there is a significant difference between the DSST scores of the control group before the experiment and the experimental group (meditation group) after the experiment (t=-357.130, p<0.01). It shows that in the absence of significant differences in the pre-experimental data, the experimental group (meditation + medication group) shows a substantial increase in DSST scores and a significant improvement in the speed of information processing after the intervention through the combination therapy, as follow Table 1.

**Table 1:** Comparison of SWLS, DSST total scores between experimental (meditation group) and control group (M±SD).

| sports event | 2 months ago | | | 2 months later | | | t1 | t2 | t3 | t4 | t5 | t6 | t7 | t8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Experimental group (meditation group) (1) | Control subjects (2) | Experimental group (meditation + medication group) (3) | Experimental group (meditation group) (4) | Control subjects (5) | Experimental group (meditation + medication group) (6) | | | | | | | | |
| SWLS | 14.779 ±0.571 | 14.821 ±0.536 | 14.717 ±0.631 | 29.200 ±0.723 | 14.828± 0.670 | 30.517 ±1.487 | -0.636 | -181.826** | -0.101 | 0.660 | -192.473** | 0.395 | -9.596** | -117.243** |
| DSST | 35.697 ±0.767 | 35.731 ±0.719 | 35.655 ±0.776 | 76.959± 1.190 | 35.682± 0.903 | 80.076 ±2.838 | -0.395 | -357.570** | -0.540 | -0.140 | -357.130** | 0.457 | -12.197** | -184.577** |

**Note:** **P<0.01, *P<0.05. t1: Comparison of (1) with (2) t-value; t2: Comparison of (1) with (4) t-value; t3: Comparison of (2) with (5) t-value; t4: Comparison of (1) with (5) t-value; t5: Comparison of (2) with (4) t-value; t6: Comparison of (1) with (3) t-value; t7: Comparison of (4) with (6) t-value; t8: (3) Comparison of t-values with (6).

## Discussion

In this study, before the experiment, no significant differences existed between the scores of the experimental group (meditation group) and the control group and the experimental group (meditation + medication group) on the DSST and SWLS. After 2 months of meditation training, participants in the experimental group (meditation group) show significant differences in scores on DSST and SWLS (t=-181.826, P<0.01; t=-357.570, P<0.01), which indicated that meditation training could effectively improve participants' scores on DSST and SWLS. Similarly, participants in the experimental group (meditation + medication group) show significant differences in scores on DSST and SWLS after 2 months of combined treatment with meditation training and antidepressant medication (t=-117.243, P<0.01; t=-184.577, P<0.01), indicating that the combined effect of meditation training and antidepressant medication can also effectively improve participants' scores on DSST and SWLS. Medication together is equally effective in improving participants' scores on DSST and SWLS. In comparison, the scores of the experimental group (meditation + medication group) on DSST and SWLS after the experiment are 30.517 and 80.076, which are higher than the scores of the experimental group (meditation group) on DSST and SWLS after the experiment, which are 29.200 and 76.959, which showed that the effect of the joint action of meditation training and antidepressant medication is better than the effect of meditation training.

In contrast, participants in the control group does not show significant differences in their DSST and SWLS scores after two months of watching movies (t=-0.101, P>0.05; t=-0.540, P>0.05), which verifies that although meditation training and movie-watching can also allow participants to achieve the purpose of realizing physical and mental relaxation, the effects of professional meditation training and recreational activities like watching movies are different. We believe that the main reason for this difference is that meditation training consciously allows participants to focus on a certain aspect of the body (e.g., the frequency of breathing) and truly achieve a state of forgetfulness, no longer worrying about the unpleasantness of life, so that the body and mind can be deeply relaxed. As a result, Information Processing Speed (IPS) was faster and life satisfaction levels are higher. While watching movies, although it can make participants feel joyful about observing things of interest, and this mood by nature cannot be continued for a long period of time, besides, the participants do not forget about the unpleasantness in their lives, so the effect on improving the body and mind is limited.

## Conclusion

The experimental study shows that experimental participants can effectively improve Information Processing Speed (IPS) and Satisfaction with Life (SWL) through meditation training, and the effect of using a combination therapy of meditation and medication is more significant. Therefore, in the future treatment of depression, psychiatrists can incorporate meditation training into new adjunctive treatments based on medication to accelerate the therapeutic effect of depressed patients. In view of the serious situation of mental illness faced by human beings all over the world, it is necessary for us in future research to apply meditation training to different populations to understand the effects of meditation training on improving Information Processing Speed (IPS) and Life Satisfaction (SWL) in different groups and accumulate more and more evidence for the promotion and application of meditation training.

## Declarations

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**Data availability statement:** The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

**Consent for publication:** Not applicable.

**Competing interests:** The authors declare that they have no known competing financial interests or personal relationships that might influence the work reported here.

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