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# The Effectiveness of Cognitive-Behavioral Training on Quality of Life and Anxiety Among Students of the Islamic Azad University, Shiraz Branch

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A B S T R A C T

**Objective:** The present study aimed to examine the effectiveness of cognitive-behavioral training on the quality of life and anxiety of university students.

**Methods and Materials:** This quasi-experimental research employed a pretest-posttest design with a control group and a two-month follow-up. Through convenience sampling, 72 participants were selected and randomly assigned to two groups of 36 individuals. Both groups completed the Beck Anxiety Inventory and the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF) at the pretest, posttest, and follow-up stages. The experimental group received cognitive-behavioral training over eight sessions. Finally, the data were analyzed using SPSS software, version 28.

**Findings:** Findings from univariate and multivariate covariance analyses indicated that cognitive-behavioral training had a significant effect on both quality of life and anxiety at posttest and follow-up stages, with a significance level of ($p < .05$).

**Conclusion:** Thus, it can be concluded that cognitive-behavioral training effectively improves the quality of life and reduces anxiety in university students.

***Keywords:*** *Cognitive-behavioral training, quality of life enhancement, anxiety, students*

## 1. Introduction

University students play a vital role in society, with their importance being assessable from various perspectives. Some of the roles and significance of students in society include knowledge production, where students, by attending universities and higher education centers, engage in creating knowledge and conducting scientific research that contributes to scientific and technological advancement in society (Riccomini et al., 2024; Rudolph, 2024; Sadat Mousavi & Ebrahimi, 2024). Another significant role is the training of a skilled workforce; through academic and educational courses, students acquire the skills and knowledge required to enter the job market, thus playing a crucial role in the economic development of society. In addition, students contribute to the transmission of cultural and social values by sharing their values, culture, and experiences with others in educational settings, which supports the propagation of these values within society. Students also engage in social and political activities. As a dynamic group within society, they can play an influential role in these domains, thereby aiding social and political transformations (Williams, 2024; Zebari, 2024).

Improving students' quality of life is highly important and has broad positive impacts on their lives. Enhancing quality of life for students is significant because it promotes better academic performance; a healthy, balanced, and fulfilling life can enhance students' academic capabilities, where a positive mental and physical state improves focus, memory, and cognitive abilities (Esfahani & Aghili, 2020; Kiarad, 2020). Furthermore, students with a better quality of life tend to have increased resilience and endurance, showing greater resistance to stress, pressures, and challenges associated with academics and daily life. A quality life also contributes to students' enhanced satisfaction and well-being, leading to greater levels of happiness and a sense of personal well-being. Moreover, a quality life positively impacts social relationships, helping students improve their connections with friends, family, and others, fostering healthy and positive interactions. Quality of life also impacts physical and mental health, assisting students in maintaining their well-being and helping to prevent the development of illnesses and psychological disorders (Pourhamidi et al., 2019).

Anxiety is a common issue that may negatively impact the quality of life among students. The detrimental effects of anxiety on students' quality of life include reduced academic performance, where anxiety decreases students' focus, memory, and analytical and problem-solving skills, thus lowering their academic success (Karbalaei-Valiha, 2012). Anxiety also affects social relationships, as individuals with anxiety may struggle to establish and maintain relationships with friends, family, and classmates, often leading to feelings of loneliness and isolation. Additionally, anxiety reduces satisfaction and happiness, lowering students' sense of personal well-being and adversely impacting their lives (Larijani, 2021). Anxiety can also have negative effects on physical and mental health, causing physical issues such as sleep disorders, headaches, muscle pain, and psychological problems like depression and stress. It also reduces resilience and endurance, diminishing students' ability to cope with academic pressures, stresses, and challenges. These effects illustrate the widespread impact of anxiety on students' quality of life, underlining the necessity of addressing anxiety issues and implementing suitable solutions for its management (Abazari, 2023; Mahmoudi & Entazari, 2021; Taee, 2018).

Cognitive-behavioral training is an effective tool for managing anxiety and improving individuals' quality of life (Asadi Bejaieh et al., 2022; Babapour et al., 2019; Barello et al., 2023; Maj et al., 2023; Pfund et al., 2023; Pourhamidi et al., 2019; Rezaei et al., 2021). Cognitive-behavioral therapy (CBT) is a psychotherapy approach that employs methods such as cognitive restructuring and behavior modification to help individuals recognize and change dysfunctional and negative attitudes. This approach not only alleviates anxiety symptoms and enhances mental health but also improves coping skills for managing anxiety (Getu et al., 2021; Ghasemi et al., 2022; Jafari et al., 2022; Kiani et al., 2019; Sun et al., 2019; Yousefi et al., 2019).

The present study, therefore, aimed to examine the effectiveness of cognitive-behavioral training on quality of life and anxiety among students at the Islamic Azad University, Shiraz Branch. Additionally, in this chapter, following the statement of the problem and the discussion on the significance and necessity of this research, the objectives and hypotheses are presented, along with the conceptual and operational definitions of the variables.

## 2. Methods and Materials

### *2.1. Study Design and Participants*

The present study is applied in terms of purpose and quantitative in nature, employing a quasi-experimental method with a pretest-posttest design, including a control group and a two-month follow-up. The study population



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consisted of master's students at the Islamic Azad University, Shiraz Branch (2023 entry). Through convenience sampling from all master's programs at the Islamic Azad University, Shiraz Branch, a sample size of 72 was selected. Participants were randomly assigned by the researcher into two groups, with 36 in the experimental group and 36 in the control group. Inclusion criteria included providing informed consent for participation, absence of specific psychiatric medications that might affect the study results, and not participating in counseling or psychotherapy sessions during the study. Exclusion criteria included unwillingness to cooperate, onset of sudden illness, inability to continue cooperating, and failure to complete training exercises consistently.

In this study, the researcher initially obtained an ethics code from the ethics committee of the Islamic Azad University, Shiraz Branch. Pretests were conducted for both experimental and control groups using the questionnaires described in the tools section. Participants in the experimental group then received eight 90-minute sessions of cognitive-behavioral training. At the end of the training sessions, a posttest was administered to both the experimental and control groups. Finally, after a two-month follow-up, data from the pretest, posttest, and follow-up stages were analyzed.

### *2.2. Measures*

#### *2.2.1. Anxiety*

The Beck Anxiety Inventory (BAI) was designed by Beck and Steer (1988) to assess anxiety. This is a self-report inventory designed to measure the severity of anxiety in adolescents and adults, containing 21 items. It uses a four-point Likert scale (0 = Not at all, 1 = Mild, 2 = Moderate, 3 = Severe) to assess anxiety. To calculate each subscale score, the individual item scores for that subscale are summed. The overall score is calculated by summing the scores of all items, with a range of 0 to 63; higher scores indicate greater anxiety levels. In a study by Beck et al. (1998), the internal consistency coefficient was reported at 0.92, and the test-retest reliability over one week was 0.75, with item correlations ranging from 0.30 to 0.76. In a study by Lovibond, Whittle, and Gatz (2005), the internal consistency of the Beck Anxiety Inventory was reported to be above 0.82. Additionally, reliability was assessed by Fydrich, Dowdall, and Chambless (1992), who reported a Cronbach's alpha coefficient of 0.94 for the Beck Anxiety Inventory. According to international studies, five types of validity—content, concurrent, simple, diagnostic, and factorial—have been evaluated and confirmed for this inventory (Beck & Steer, 1990). Rafiei and Seifi (2013) reported a Cronbach's alpha of 0.90 in their findings, while Kavyani and Mousavi (1999) reported a test-retest reliability coefficient of 0.83 after one month and a Cronbach's alpha of 0.92. In the study by Kavyani and Mousavi (1999), the validity coefficient was 0.72, and Rafiei and Seifi (2013) reported a validity level of $P < .001$ and $r = 0.72$ (Sajadian et al., 2023).

#### *2.2.2. Quality of Life*

The WHOQOL-BREF Quality of Life Questionnaire (short form) was created by Ware and Sherbourne in 1992 and includes 36 items divided into eight subscales, each comprising 2 to 10 items. These subscales are physical functioning, role limitations due to physical health, role limitations due to emotional health, energy/fatigue, emotional well-being, social functioning, pain, and general health. Combining the subscales yields two overall scales, labeled physical health and mental health. In this questionnaire, lower scores indicate lower quality of life. The physical health subscale is calculated by summing the subscales of physical functioning, role limitations due to physical health, pain, and general health. The mental health subscale is calculated by summing the subscales of role limitations due to emotional health, energy/fatigue, emotional well-being, and social functioning. In the study by Montazeri et al. (2005), the content, face, and criterion validity of this questionnaire were evaluated as adequate. Additionally, the Cronbach's alpha coefficient calculated in the study by Montazeri et al. (2005) for this questionnaire was estimated at 0.78 (Jafari et al., 2022; Razmjooei, 2022).

### *2.3. Intervention*

#### *2.3.1. Cognitive-Behavioral Training*

In the present study, cognitive-behavioral training consisted of a series of instructions and techniques based on the protocol by Hawton et al. (2010), delivered in eight 90-minute group sessions to the experimental group. A brief description of the training sessions from Hawton et al.'s (2010) protocol is provided below (Asadi Bejaieh et al., 2022; Babapour et al., 2019; Jafari et al., 2022; Maj et al., 2023; Peyvanpour Kaloukhi et al., 2016; Pourhamidi et al., 2019; Rezaei et al., 2021; Sun et al., 2019).

Session 1



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Introduction, presentation of basic information about cognitive-behavioral psychotherapy, explanation of the reason and purpose for conducting group cognitive-behavioral therapy sessions, outlining the rules and principles of therapy sessions, and assigning an introductory task to help group members become familiar with completing assignments.

Session 2

Explanation of the connection between thoughts, feelings, and behaviors, including how thoughts create feelings and behaviors and how thoughts can increase or decrease emotions. Techniques like the ABC model are introduced, explaining how the same event can lead to different thoughts, which in turn generate various emotions and behaviors; the accuracy of thoughts is assessed by examining facts. Emotional intensity and belief strength are rated, with an exploration of fluctuations in specific beliefs and a discussion of pros and cons. The differences between thoughts, emotions, and behaviors are clarified. Techniques such as distinguishing thoughts from reality and explaining dysfunctional thinking styles and automatic thoughts are presented. Common cognitive errors are identified, and techniques for identifying cognitive distortions, such as personalization, are introduced. A worksheet for cognitive restructuring is distributed.

Session 3

Review of worksheets from the previous session, explanation of the four main steps for cognitive restructuring (identifying thoughts using techniques such as challenging "should" thinking, identifying conditional beliefs, and examining the value system; evaluating thoughts using techniques such as downward arrow, modifying thoughts, and determining the effects of revised thoughts with techniques like defining terms, examining evidence, and role-playing both sides of a thought). A new cognitive restructuring worksheet is distributed.

Session 4

Review of worksheets from the previous session, examination of the chain of cause, response, and consequence, explanation of how consequences fit into a larger behavioral chain, and introduction of strategies to break destructive chains through techniques such as thought sequencing. Behavioral fluctuations in various situations are explored, along with changing negative thoughts through behavioral modification.

Session 5

Definition of assertive behavior, visualization of a situation where it is challenging to act assertively, recommended self-talk to increase assertiveness, distinction between passive, aggressive, and assertive behaviors, and examples of negative thoughts and self-talk that hinder assertiveness.

Session 6

Definition of impulse and discussion on impulse management with strategies for greater self-control, suggestions for mood improvement, and increasing pleasant events. A worksheet for pleasant activities is distributed.

Session 7

Review of worksheets from the previous session, explanation of stress, stressors, and stress management, problem-solving strategies, and introduction to progressive muscle relaxation.

Session 8

Definition of self-esteem, explanation of how negative self-evaluations can diminish self-esteem, strategies for enhancing self-esteem, distribution of a self-concept worksheet, planning for relapse prevention, emphasizing the necessity of practicing the skills acquired during sessions, evaluating progress and acquired skills, and reviewing tasks from previous sessions.

### *2.4. Data analysis*

For data analysis, descriptive statistics were used to describe demographic and main variables, and inferential statistics were employed to test the hypotheses. Descriptive statistics included calculations of mean, standard deviation, skewness, and kurtosis of scores. Inferential statistics involved using univariate analysis of covariance (ANCOVA) and multivariate analysis of covariance (MANCOVA). For data analysis, SPSS software, version 28, was utilized.

## 3. Findings and Results

The demographic information results revealed that both the experimental and control groups each comprised 36 participants. Fisher's exact test was used to assess the homogeneity of gender and marital status between the two groups. Results indicated no significant differences between the groups regarding baseline characteristics, such as gender and marital status ($p > .05$). Most respondents in both groups were female and unmarried. Additionally, there was no significant difference in mean age between the two groups ($p > .05$). The mean age in the cognitive-behavioral training (CBT) group was 26.52 years, while it was 27.19 years in



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the control group, confirming age homogeneity between groups.

The descriptive statistics for anxiety, physical health, and mental health variables across pretest, posttest, and follow-up for both groups are provided in Table 1.

**Table 1**

*Descriptive Statistics for Anxiety by Group and Time*

| Variable | Time | CBT Group Mean | CBT Group SD | Control Group Mean | Control Group SD |
|---|---|---|---|---|---|
| Anxiety | Pretest | 25.45 | 7.32 | 20.86 | 5.44 |
| | Posttest | 17.30 | 6.63 | 20.37 | 5.44 |
| | Follow-up | 21.17 | 6.87 | 20.45 | 5.44 |
| Physical Health (Total) | Pretest | 75.47 | 11.41 | 77.73 | 8.24 |
| | Posttest | 84.47 | 7.71 | 77.83 | 6.57 |
| | Follow-up | 76.02 | 7.59 | 77.79 | 6.33 |
| Mental Health (Total) | Pretest | 44.86 | 6.78 | 45.08 | 7.08 |
| | Posttest | 53.08 | 7.83 | 47.89 | 7.69 |
| | Follow-up | 48.32 | 7.25 | 47.27 | 7.50 |

The normality of data distribution was evaluated using skewness, kurtosis, and the Shapiro-Wilk test. For skewness and kurtosis, values between -2 and +2 indicated a normal univariate distribution. All variables in both the CBT and control groups exhibited normal distributions, confirmed by Shapiro-Wilk results ($p > .001$). Levene's test also supported the homogeneity of variances for all variables ($p > .05$). Consequently, the data were suitable for parametric testing with analysis of covariance.

The ANCOVA results within MANCOVA tested the intervention's effectiveness on physical and mental health at the posttest stage, as shown in Table 2.

**Table 2**

*ANCOVA Results Within MANCOVA for Effectiveness on Physical and Mental Health*

| Test Stage | Source of Change | Dependent Variable | Sum of Squares | df | Mean Square | F Value | p Value | Effect Size |
|---|---|---|---|---|---|---|---|---|
| Posttest | Group | Physical Health | 163.28 | 1 | 163.28 | 11.76 | 0.002 | 0.231 |
| Posttest | Group | Mental Health | 286.23 | 1 | 286.23 | 17.33 | 0.001 | 0.318 |

The posttest results confirmed the effectiveness of CBT on both physical and mental health dimensions ($p < .05$). The effect size (partial eta squared) showed that the intervention had a greater impact on mental health ($\eta^2 = 0.318$) than on physical health ($\eta^2 = 0.231$). Adjusted means for these dimensions, analyzed using the Bonferroni test, are presented in Table 3.

**Table 3**

*Adjusted Means Comparison for Physical and Mental Health with Bonferroni Test*

| Test Stage | Variable | Group | Adjusted Mean | Standard Error | Lower Bound | Upper Bound | Mean Difference | p Value |
|---|---|---|---|---|---|---|---|---|
| Posttest | Physical Health | CBT Intervention | 68.24 | 0.426 | 67.80 | 69.55 | 4.89 | 0.002 |
| Posttest | Physical Health | Control | 73.13 | 0.426 | 73.18 | 76.08 | - | - |
| Posttest | Mental Health | CBT Intervention | 51.99 | 0.612 | 52.89 | 53.45 | 3.24 | 0.001 |
| Posttest | Mental Health | Control | 55.23 | 0.612 | 54.35 | 56.32 | - | - |

The adjusted mean for physical health at posttest in the CBT group was 68.24, 4.89 points higher than in the control group. The adjusted mean for mental health at posttest in the CBT group was 51.99, 3.24 points higher than the control group. These findings show that posttest adjusted means for both health dimensions were significantly higher in the CBT group than in the control group.

The ANCOVA results evaluating the effectiveness of CBT on anxiety are summarized in Table 4.



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**Table 4**

*ANCOVA Results for Effectiveness on Anxiety*

| Source of Change | Sum of Squares | df | Mean Square | F Value | p Value | Effect Size |
|---|---|---|---|---|---|---|
| Group | 1227.11 | 1 | 1325.17 | 4.27 | 0.005 | 0.634 |
| Pretest | 14543.21 | 1 | 12621.25 | 46.27 | 0.001 | 0.721 |
| Error | 1336.10 | 70 | 1129.08 | - | - | - |

The findings indicated that the CBT intervention effectively reduced anxiety levels ($p < .05$). The effect size for the group was $\eta^2 = 0.634$, indicating that CBT intervention explained 63.4% of the variance in anxiety. The adjusted mean comparison for anxiety between groups, analyzed using the Bonferroni test, is presented in Table 5.

**Table 5**

*Adjusted Means Comparison for Anxiety with Bonferroni Test*

| Variable | Group | Adjusted Mean | Standard Error | Lower Bound | Upper Bound | Mean Difference | p Value |
|---|---|---|---|---|---|---|---|
| Anxiety | CBT Intervention | 57.53 | 2.45 | 56.12 | 58.20 | 11.21 | 0.005 |
| Anxiety | Control | 46.32 | 2.03 | 47.17 | 48.13 | - | - |

The adjusted mean for anxiety in the CBT group was 57.53, 11.21 points lower than in the control group (46.32), with no overlap between confidence intervals, confirming the intervention's significant effect in reducing anxiety.

To evaluate the lasting effect of CBT, a paired T-test compared follow-up and pretest anxiety scores in the intervention group, as shown in Table 6.

**Table 6**

*Paired T-Test Results for Follow-Up vs. Pretest in Intervention Group*

| Variable | Pretest Mean | Pretest SD | Follow-up Mean | Follow-up SD | Mean Difference | p Value |
|---|---|---|---|---|---|---|
| Anxiety | 50.03 | 4.28 | 48.22 | 5.33 | 1.81 | 0.002 |

The follow-up mean anxiety score was 1.81 points lower than the pretest score, indicating a lasting reduction in anxiety due to the CBT intervention ($p < .05$). These findings demonstrate the enduring impact of CBT on anxiety reduction over time.

## 4. Discussion and Conclusion

In this study, the effectiveness of cognitive-behavioral training on the overall quality of life score among students at the Islamic Azad University, Shiraz Branch, was tested using univariate analysis of covariance (ANCOVA). The results indicated that the training significantly impacted the overall quality of life score.

An examination of the adjusted means showed that the adjusted mean of quality of life in the experimental group was 9.33 points higher than in the control group, with this difference being statistically significant. There was no overlap in the confidence intervals between the two groups, indicating that the applied training effectively improved students' quality of life. These results align with the prior findings (Asadi Bejaieh et al., 2022; Babapour et al., 2019; Getu et al., 2021; Ghasemi et al., 2022; Jafari et al., 2022; Kiani et al., 2019; Maj et al., 2023; Peyvanpour Kaloukhi et al., 2016; Pfund et al., 2023; Pourhamidi et al., 2019; Rezaei et al., 2021; Sun et al., 2019; Yousefi et al., 2019).

Cognitive-behavioral training (CBT) is based on the principle that thoughts, emotions, and behaviors influence each other, and by modifying negative and dysfunctional thoughts, positive emotions and more constructive behaviors can be fostered. Quality of life is a broad concept encompassing many dimensions, and students often face academic, social, and economic pressures that increase stress and reduce quality of life. CBT helps them develop effective strategies and compatible behaviors to manage stress through emotion regulation (Babapour et al., 2019). CBT



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techniques, particularly interpersonal techniques, can assist students in improving social skills such as effective communication, conflict resolution, decision-making, and self-confidence, while cognitive techniques can help them manage negative moods, ultimately enhancing their interpersonal relationships and quality of life (Hofmann, 2012). These techniques enable students to identify and change their negative thought patterns, promoting positive emotions and reducing negative ones (Beck, 2011). Additionally, CBT teaches students how to face life's challenges, enhancing their resilience to pressures and improving their quality of life (Jafari et al., 2022).

In conclusion, cognitive-behavioral therapy can serve as an effective tool for enhancing students' quality of life. By reducing psychological symptoms, improving social skills, and developing coping strategies, students can better manage daily challenges, thereby improving their overall quality of life. This study also found that CBT techniques, such as rating emotions and belief strength, examining specific belief fluctuations, evaluating pros and cons, distinguishing thoughts from emotions and behaviors, addressing cognitive distortions, and using techniques to identify cognitive distortions, helped optimize students' thoughts, emotions, and feelings, which contributed to an improvement in their quality of life.

The effectiveness of CBT on the overall anxiety score was also examined using ANCOVA, confirming that the training significantly reduced anxiety. An examination of the adjusted means showed that the adjusted mean anxiety score in the experimental group was 8.74 points lower than in the control group, a statistically significant difference. There was no overlap in the confidence intervals, indicating that the training effectively reduced anxiety among students. These findings are consistent with the prior studies (Asadi Bejaieh et al., 2022; Babapour et al., 2019; Barello et al., 2023; Jafari et al., 2022; Maj et al., 2023; Nolan, 2002; Nowroozian Nasrabadi, 2018; Peyvanpour Kaloukhi et al., 2016; Pougoci et al., 2021; Pourhamidi et al., 2019; Rezaei et al., 2021; Sun et al., 2019; Taee, 2018; Yadegari, 2012).

Anxiety is a common issue among students, often negatively affecting academic performance, social relationships, and overall quality of life. CBT is recognized as an effective method for managing anxiety. This approach is grounded in the principle that thoughts, emotions, and behaviors are interconnected, and altering one of these elements can lead to changes in the others. CBT helps students identify and modify negative and dysfunctional thought patterns, such as perfectionistic thoughts, fear of failure, and negative self-evaluation, which can reduce anxiety (Sun et al., 2019).

Additionally, CBT provides students with coping skills to handle stressful and anxiety-provoking situations more effectively. These skills include relaxation techniques, time management, and problem-solving, which can help reduce anxiety (Nolan, 2002; Pougoci et al., 2021). A key technique in CBT is gradual exposure to anxiety-provoking situations, helping students confront their fears and feel more in control of their anxiety (Pourhamidi et al., 2019; Rezaei et al., 2021). In the present study, CBT techniques, including controlling negative self-evaluation, boosting self-esteem, identifying stress-inducing situations, enhancing problem-solving skills, and fostering assertive rather than passive or aggressive behavior, contributed to anxiety reduction in students.

## 5. Limitations & Suggestions

The most notable limitations of this study include the sole use of questionnaires for data collection, warranting caution when generalizing the results. The study was limited to students of the Islamic Azad University, Shiraz Branch, thus restricting the generalizability of findings to other populations. Additionally, the quasi-experimental nature of the study limits the extent to which results can be generalized. Future research should incorporate other methods, such as interviews, to examine these effects. The effectiveness of CBT should be evaluated across other populations, and the impact of other educational and therapeutic models on students' quality of life and anxiety should be assessed and compared. Where possible, six- and twelve-month follow-up sessions should be included.

Based on the findings, it is recommended that cognitive-behavioral training programs for improving students' psychological constructs be developed at universities. CBT services should be more widely available to ensure every student has access to this type of training. Students should use psychological and counseling services not only for treatment but also for the general enhancement of life quality. Additionally, policymakers should extend CBT training programs to improve the psychological well-being of students' families as well.

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## Declaration of Interest



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The authors of this article declared no conflict of interest.

## Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

## Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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## Authors' Contributions

All authors equally contributed in this article.

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