# Research Paper
# Beneficial Effects of Mindfulness-based Cognitive Therapy on Resilience and Psychological Distress in Patients Recovered From COVID-19

**Zahra Malekpour Golsefidi[1]** , **Farnaz Keshavarzi Arshadi[1]\*** , **Suzan Emamipour[1]**

*1. Department of Psychology, Central Tehran Branch, Islamic Azad University, Tehran, Iran.*

## ABSTRACT

**Background:** The medium and long-term problems of COVID-19 survivors after hospital discharge are currently unknown, but new evidence is emerging. This study was conducted with the aim of the effectiveness of mindfulness-based cognitive therapy (MBCT) on resilience and psychological distress of recovered patients from COVID-19 in Tehran City, Iran, in 2021.

**Methods:** The study was a quasi-experimental type of pre-test-post-test design with a control group with a 2-month follow-up. The statistical population included all patients 25-55 years in Tehran City in 2021 with 4 to 8 weeks of discharge. The sample included 30 people who recovered from COVID-19 who had symptoms of depression, anxiety, and stress (based on [depression, anxiety and stress scale] DASS-21 scores) and was selected by purposive sampling and based on the inclusion criteria, and then matching assigned to an experimental (MBCT) and a control group (n=15each). The experimental group received 8 sessions of 60 minutes of mindfulness-based cognitive therapy (individual and online) but the control group received no intervention. The research tools were the DASS-21 and Connor-Davidson resilience scale (CD-RISC). Data were analyzed using a mixed analysis test and Ben Foroni post hoc test using SPSS version 23 software.

**Results:** The results showed that MBCT in the post-test positively affected the resilience (F=30.31, P=0.001) and negatively affected the psychological distress (F=120.70, P=0.001) of those who Recovered from COVID-19. This therapeutic effect continued until the follow-up phase. According to the results, MBCT is effective in increasing resilience and reducing psychological distress and a significant difference is observed between the experimental and control groups (P=0.01).

**Conclusion:** Based on the findings, MBCT is effective in increasing resilience and reducing psychological distress after illness and the use of this model can be useful in the psychological rehabilitation of those who have recovered from COVID-19.

**Keywords:** Mindfulness, Resilience, Psychological distress, Post-acute COVID-19 syndrome

**\* Corresponding Author:**
*Farnaz keshavarzi Arshadi, PhD .*
*Address: Department of Psychology, Central Tehran Branch, Islamic Azad University, Tehran, Iran.*
*Phone: +98 (21) 22481631*
*E-mail: far.keshavarzi@gmail.com*

## 1. Introduction

The COVID-19 epidemic has caused an increase in public panic and mental health stress and resulted in various psychological problems in society, especially among patients [1]. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) belongs to the beta-corona viruses, which are mainly transmitted through respiratory droplets and close contact, and they can be found in human respiratory epithelial cells, which firstly attack the lungs [2]. Suspected COVID-19 patients have physical and psychological problems. After hospital admission, strictly isolated, visits were restricted. Moreover, COVID-19 and its consequences were a frequent subject in the media, and patients were constantly reminded of the possible severity of the disease [3]. Depressive, anxiety and sleep symptoms develop in patients with COVID-19 while hospitalized [4], they show forms of psychological distress, including fear, panic attack, stigmatization, avoidance behaviors, irritability, insomnia, intrusive memories, psychotic symptoms, psychomotor excitement, and posttraumatic stress disorder (PTSD), which may interfere with subsequent physical recovery, and anxiety and psychological distress may persist after recovery [5, 6]. Data from the previous SARS and Middle East respiratory syndrome (MERS) epidemics support this concern and early studies suggest that up to 50% of COVID-19 patients suffer from psychological distress within two months after hospital discharge [7]. Psychological distress is a set of symptoms of depression and anxiety and non-adaptive psychological functioning at the level of stressful events in life, and physical diseases are also a powerful factor in predicting the possibility of damage in physical, psychological, and social actions and the occurrence of intra-personal and interpersonal problems [8]. Psychology deals with not only mental disorders but also psychological strengths within individuals. Psychological strengths play a vital role in dealing with the complications of COVID-19 disease [9].

One of the protective factors in preventing psychological disorders is resilience. Rapid recovery and the ability to return to daily functioning after experiencing stressful life events have resulted in functional breakdown [10]. During the COVID-19 pandemic, individuals' resilience may have decreased while their vulnerability increased. This is why resilience can be considered a crucial component in coping with the fear, panic, anxiety, and stress resulting from COVID-19 [9].

Considering that the pandemic is characterized by uncertainty, psychological distress, and lack of visibility of the future, its harmful impacts should be promptly faced with systematic psychological self-care. Recent studies reported that psychological distress (symptoms of stress, anxiety, and depression) is high during traumatic events, such as life-threatening diseases. Several studies reported that a mindfulness-based protocol provides useful skills for dealing with traumatic events [11]. Behan believes that meditation and mindfulness are practices that can support healthcare professionals, patients, caregivers, and the general public in times of crisis, such as the current global pandemic caused by COVID-19. Introducing a mindfulness and meditation practice during this pandemic has the potential to complement treatment and is a low-cost beneficial method to provide support for anxiety for everyone [12].

Mindfulness-based cognitive therapy (MBCT) is an intervention that integrates mindfulness meditation with elements of cognitive behavioral therapy. MBCT aims to help the patient recognize maladaptive cognitions, emotions, and bodily sensations, and communicate with them in a non-judgmental and compassionate manner. MBCT may be a helpful approach to reduce the self-blaming, catastrophizing cognitions, and misinterpretations of bodily sensations (e.g. breathlessness) that have been associated with patterns of anxiety, demobilization, and depression in patients [13]. Researchers conclude that MBCT is effectively and safely delivered in routine clinical settings, although its use has broadened from its original target population to include people experiencing current depression. Implications for implementation are discussed [14]. In the research conducted on various patients, including respiratory patients, MBCT showed a statistically significant and durable effect on psychological distress, indicating that MBCT may be an efficacious add-on to standard PR programs in them [15]. Due to the unknown side effects of the disease, comprehensive research is considered one of the current requirements. According to the above reports and the significant population who have recovered from COVID-19 in Iran and the essential role of self-awareness and acceptance in improving the above symptoms; considering the lack of comprehensive intervention studies in this field, the present research was conducted with the aim of the effectiveness of MBCT on resilience and psychological distress of survivors of COVID-19 in Tehran City, Iran.

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## 2. Methods

The current research was a semi-experimental study with a pre-test-post-test design and a two-month follow-up with two groups of MBCT group and a control group. Participants were identified using a centralized list of patients discharged from general hospitals (Hazrat Vali Asr and Imam Sajjad hospitals) in Tehran City, Iran, designated by the government to admit COVID-19 from February 2021 to June 2021. To determine the sample size of the present study, it was referred to Cohen's Table. Considering the effect size of 0.7 according to the background of the study, the power test of 0.91, and the significance level of 0.05 according to Cohen's Table, it was found that the minimum sample size for each group is 15 people, a total of 30 patients included in the study.

The hypothesis with a power of 0.96 was needed. Therefore, among all eligible patients, 30 people who were willing to participate in the experiments were randomly selected. They were placed into the experimental group (15 people) and the control group (15 people). The inclusion criteria included a definite diagnosis of COVID-19 (reverse transcriptase-polymerase chain reaction [RT–PCR] positive and pulmonary involvement [lesion observed by chest radiography or chest CT scan] and c-reactive protein [CRP] positive), aged 25-55 years, 4-8 weeks since discharge from hospital for the index admission, not currently hospitalized, no need for ICU care, no underlying physical diseases, IHD disease, diabetes, cancer, and severe psychological disorders, in the depression, anxiety and stress scale (DASS 21), they should have symptoms of moderate psychological distress based on the cut-off point (anxiety≥9, depression≥13, stress≥17), DASS≥39, and have a smartphone and be able to use it.

The exclusion criteria included turning to alcohol or drugs during the period, not following the treatment plan and not doing their homework, and suffering from serious debilitating physical diseases. The instruments of the present study included a demographic information questionnaire, DASS-21, and the Connor-Davidson resilience scale (CD-RISC). Since all outcomes were related to and reported by individual patients, study objectives were related to the individual level. Ethics approval was obtained from the Ethics Committees of the Islamic Azad University, Central Tehran Branch (Code: IR.IAU.CTB.REC.1400.031). Demographic variables included age, gender, and marital status/literacy level.

### Depression, anxiety, and stress scale (DASS-21)

Psychological distress was measured using the DASS-21 [16]. DASS is a short screening tool whose items is based on the questionnaire (level of depression, anxiety, and stress) in a community with 21 items (7 questions for sub-scale) and self-report. The final score is obtained by the total score of the related questions. Each question was scored using a Likert scale ranging from 0 (not at all/never) to 3 (very much, or most of the time/almost always). Higher scores indicated a higher level of disorder based on a specific classification scoring system. Individuals were categorized into normal, mild, moderate, severe, and extremely severe based on their responses [16]. Comparing the DASS-21 results with psychiatric interviews showed that this tool has a sensitivity and specificity of 75% and 89% and can accurately screen depression, anxiety, and stress. The reliability and validity of the translated version of the Persian questionnaire were confirmed for an Iranian population, in a study conducted by Sahebi et al. In addition, the study conducted by Moradipanah et al. in Iran reported a Cronbach's alpha of 0.94 for depression, 0.92 for anxiety, and 0.82 for stress [17].

### Connor-davidson's resilience scale (CD-RISC)

Connor and Davidson's resilience scale (CD-RISC) was prepared with 25 items to measure the ability to deal with pressure and threats. For each item, it has 5 options from one (completely false) to five (always true) and measures 5 dimensions of resilience (individual competence, individual instincts, acceptance of change, control, and spiritual influences). A higher score indicates greater resilience. The cut-off point is 50. Conner and Davidson reported a Cronbach's alpha coefficient of 0.89. Also, the reliability coefficient obtained from the re-test method at a 4-week interval was 0.87 [10]. In Iran, this scale was standardized by Bigdeli et al. He used Cronbach's alpha method to determine the reliability of Conner and Davidson's resilience scale and reported a reliability coefficient of 0.90 [18].

### Procedures

In February 2021, by referring to Valiasr and Imam Sajjad hospitals in Tehran City and obtaining the consent of the hospital director, the clinical records of discharged patients were obtained based on the inclusion and exclusion criteria, and after contacting and obtaining initial consent, the link to the questionnaires was sent with WhatsApp and SMS and social networks. Data were collected through an online questionnaire based on Google form. A total of 325 questionnaires were completed, 60

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**Table 1.** Overview of the MBCT program [19]

| Sessions | Themes | Descriptions (Mindfulness and Cognitive Exercises) | Homeworks |
|---|---|---|---|
| 1 | Awareness and automatic pilot | The participants are asked to deeply feel the process of eating a raisin and then discuss their feeling. This is followed by 30 minutes of body scan medication (Paying attention to a part of the body while breathing). | The body scans every day, mindfulness of routine activity. |
| 2 | Living in our heads | Awareness, thoughts, and feelings exercise (noticing the connection between thoughts and emotional states), introducing pleasant experiences calendar (monitoring daily activities and their effects on thoughts, emotions, and bodily sensations). | Mindfulness of a routine activity every day, complete the pleasant experiences calendar. |
| 3 | Gathering the scattered mind | Awareness, 3-minute breathing space, mindful stretching, review pleasant experiences calendar, introducing unpleasant experiences calendar (monitoring daily activities and their effects on thoughts, emotions, and bodily sensations). | Mindful stretching every day, 3-minute breathing space, 3 pre-scheduled times per day, complete the unpleasant experiences calendar. |
| 4 | Recognizing aversion | Body, sounds, and thoughts, 3-minute breathing space, review unpleasant experiences calendar, automatic thoughts exercise (noticing negative automatic thoughts and their effects on emotions and bodily sensations, and knowing when to do a 3-minute breathing space). | Awareness of the heartbeat, blood flow, body, sounds, and thoughts every day, 3-minute breathing space, every time something unpleasant happens. |
| 5 | Allowing/letting to be | Being with the difficulties, walking meditation, 3-minute breathing space. | Being with difficulties every day, 3-minute breathing space every time, something unpleasant happens. |
| 6 | Thoughts are not facts | Awareness of thought and the emotional reaction, 3-minute breathing space mood, thoughts, and alternative viewpoints exercise (our mood can influence how we think about/ interpret a situation), my warning system (noticing personal signals of bad mood and anxiety). | Mindfulness exercise of personal choice every day, 3-minute breathing space every time, something unpleasant happens, complete my personal warning system. |
| 7 | How can I best take care of myself? | Awareness of spontaneous reactions of body, emotions, thoughts, 3-minute breathing space, review of the personal warning system, activities, and mood exercise (noticing the connections between daily activities and mood), introducing an action plan (a personal plan on how to best schedule activities when emotions threaten to overwhelm). | Use the mindfulness exercises that you plan to use after the program is over, and complete the personal action plan. |
| 8 | Maintaining and extending new learning | The body scan review an action plan | - |

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people had symptoms of depression, anxiety, and moderate stress according to DASS-21, and 30 people were randomly selected and matched into two groups of psychological intervention and control. Next, an experimental group received 8 weeks of 60-minute individual and online MBCT (Table 1) based on the respective guidelines, while no psychotherapy or training was administered to the control group. At the end of the sessions and two months later, the groups complete the questionnaires. The applied training program was based on the mindfulness workbook of Tizdel, Segal and Williams and was carried out under the supervision of the translators. The therapist has completed the MBCT techniques course at the Moddat institute of higher education No. 342978.

Statistical analysis SPSS sotware, version 23 was used for all statistical analyses. Following the data collection, we used descriptive statistical methods (such as Mean±SD), and inferential statistical methods, 1st, the assumption of normal distribution of the variables was checked with the Shapiro-Wilk test. Then, the data were analyzed using the analysis of variance test.

## 3. Results

Sociodemographic Data: Subjects were matched in terms of age, sex, marriage, and psychological distress score (depression, anxiety, and stress) and were placed in two groups. Of all subjects, 46% were women and 54% were men; 42% were in the age group of 45-55 years; 70% were married and 55% were bachelors. Table 2 lists

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**Table 2.** Mean±SD of the variables in experimental and control groups

| Variables | Phases | Mean±SD | |
| --- | --- | --- | --- |
| | | MBCT* | Control |
| Resilience | Pre-test | 26.53±8.21 | 25.67±8.62 |
| | Post-test | 72.67±6.33 | 30.13±9.06 |
| | Follow | 73.60±5.24 | 36.53±10.37 |
| Psychological distress | Pre-test | 39.00±6.01 | 47.27±11.79 |
| | Post-test | 5.73±2.96 | 46.47±5.75 |
| | Follow | 5.60±2.35 | 42.27±3.26 |

* MBCT: Mindfulness-based cognitive therapy.

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the Mean±SD of resilience and psychological distress in the MBCT and control groups on the pre-test and post-test and follow-up.

In order To enter the data section, 1st, the assumptions of the Shapiro-Wilk parametric covariance test (Table 3) were used to determine the normality of the data population distribution and that this assumption was true (P>0.5). Levene's test was used to determine the equality of variances and this assumption was also established (P>0.5). The results of Leven's F-test to check the homogeneity of variances in the control and experimental groups showed that in resilience (F=1.25, P=0.226) and

**Table 3.** Results of the Shapiro-Wilk test for normality of distribution of variables

| Variables | Statistics | Sig. |
| --- | --- | --- |
| Resilience | 0.941 | 0.465 |
| Psychological distress | 0.916 | 0.165 |

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**Table 4.** Results of mixed variance analysis of the effect of MBCT on resilience and psychological distress

| Variables | Factor | Sources | SS | df | MS | F | P | $\eta^2$ |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Resilience | Intragroup | Time | 951.25 | 1 | 951.25 | 30.31 | 0.0001 | 0.81 |
| | | Time×group | 1041.24 | 1 | 1041.24 | 45.21 | 0.0001 | 0.89 |
| | | Error | 97.02 | 28 | | | | |
| | Between group factor | Group | 405.25 | 1 | 405.25 | 8.75 | 0.0001 | 0.87 |
| | | Error | 82.66 | 28 | | | | |
| Psychological distress | Intergroup | Time | 775.79 | 0.0001 | 775.79 | 120.70 | 0.0001 | 0.90 |
| | | Time×group | 888.11 | 1 | 888.11 | 154.54 | 0.0001 | 0.94 |
| | | Error | 45.71 | 28 | | | | |
| | Between group factor | Group | 936.84 | 1 | 936.84 | 201.22 | 0.0001 | 0.97 |
| | | Error | 49.94 | 28 | | | | |

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**Table 5.** Bonferroni post-hoc test for pairwise comparison of the dependent variables

| Dependent Variables | Mean±SE | | |
| --- | --- | --- | --- |
| | Pre-test-Post-test | Follow-up | |
| | | Pre-test | Post-test |
| Resilience | 35.25±2.14 | 30.21±1.54 | -2.6±1.21 |
| Psychological distress | 40.77±1.57 | 36.66±1.22 | -4.32±1.33 |

psychological distress (F=0.572, P=0.326), therefore it was possible to use the covariance analysis.

As shown in Table 4, the change in resilience in the three phases of pre-test, post-test, and follow-up measurement is significant (F=30.31, P=0.0001, η=0.81). The interaction effect of time and group was also significant in the three stages of measurement (F=45.21, P=0.0001, η=0.89). The effect of group membership is (F=8.75, P=0.0001, η=0.87). Therefore, the findings showed that MBCT was effective in improving resilience. The change in psychological distress in the three phases of the pre-test, post-test, and follow-up measurement is significant (F=120.70, P=0.0001, η=0.90). The interaction effect of time and group was also significant in the three stages of measurement (F=154.54, P=0.0001, η=0.94). The effect of group membership is (F=201.22 P=0.0001, η=0.97). Therefore, the findings showed that MBCT was effective in reducing psychological distress.

The results of Table 5 show that the average difference between the post-test and pre-test and follow-up with the pre-test is significant in two dependent variables. Also, the non-significance of the average difference in the post-test and follow-up stages indicates the stability of the intervention effect in the variables in the experimental group in the follow-up phase.

## 4. Discussion

Our main findings indicated that MBCT led to clinically relevant reduction points (DASS-21) in psychological distress and improved resilience in survivors of COVID-19. Our results are consistent with the previous studies of mindfulness-based interventions that found statistically significant effects on the psychological outcomes of anxiety and perceived stress in patients [1, 13-15]. Additional analyses suggested that MBCT relieved psychological distress primarily by reducing symptoms of depression rather than anxiety, which may explain the null findings in earlier studies. Farver-Vestergaard et al. also showed that MBCT can reduce psychological

distress and anxiety in patients with chronic obstructive pulmonary disease (COPD), which may be facilitated by increased levels of self-compassion.

Liu et al. [20] showed that progressive muscle relaxation as an auxiliary method can reduce anxiety and improve sleep quality in patients with COVID-19. Finstad and his colleagues, by reviewing 46 studies conducted during the pandemic on different groups (patients/caregivers/normal people/recovered), concluded that resilience is a crucial variable in pandemic problems and its promotion at the individual and social level leads to a decrease. The consequences of the pandemic are the prevention of damage [21]. Resilience is the ability to get rid of stressful experiences, tenacity in the face of stress, the ability to return to normal, survive and strive, the ability or outcome of successful adaptation to threatening conditions, and a positive adaptation to adverse conditions. Resilience is positively related to satisfaction. Positivity, perceived social support, and even quality of nutrition and sleep have a negative relationship with symptoms of psychological distress.

Resilience is the result of the interaction between personality traits and the environment. Vinkers et al. believe that in pandemic conditions, it is necessary to pay attention to the factors related to resilience, including life context, coping strategies, personal history and, if possible, biological characteristics, such as (epi) genetics, and resilience is a protective shield for coping with pandemic conditions [22]. Resilience is pivotal to cope with stress and maintaining balance. Since resilience is associated with emotion regulation strategies, therefore it can be related to depression and anxiety caused by negative emotions [9]. Mindfulness means being aware of the present moment and is defined as the individual tendency to focus attention and awareness on the current experience. Meditation usually refers to a formal practice that can calm the mind and enhance awareness of ourselves, our minds, and our environment. Meditation comes under the umbrella of 'mindfulness' which is a broader concept. Formal

meditation practices include mindfulness of breathing, compassion, or loving-kindness meditation [12].

The role of mindfulness in mitigating reactivity and improving emotion regulation in stressful situations has been confirmed [23]. In this approach, mindfulness involves "mind-openness" that enables the potential for possible multiple perspectives. Therefore, a conscious attitude rejects the narrow view of "good" and "bad", as well as any other categories (including diagnostic labels). Mindfulness is a kind of encountering thoughts and emotions that leads to identifying and desensitizing habitual responses and reducing avoidant behaviors [18]. In other words, mindfulness promotes awareness of bodily sensations which, in turn, alleviates stress. In this intervention, the common sources of stress in this group and the proper reaction to stress were introduced, which enhances awareness of common stressful situations and, in some cases, eliminates these sources. Diaphragmatic breathing instructed in MBCT mitigates the negative impacts of stress. MBCT techniques promote awareness of thoughts that induce anxiety and stress. Moreover, identifying and challenging these unreasonable thoughts lead to a more logical and realistic examination of them, which alleviates anxiety [24]. Threats to physical and mental health, anxiety and worry, and a person's involvement with rumination and symptoms of depression, loss of job and educational positions, and impairment in social relations have significant negative effects. Therefore, benefiting from methods that can eliminate rumination, control pain, eliminate or reduce symptoms of anxiety and depression and change ineffective attitudes and increase feelings of efficiency and life expectancy can lead to acceptance of the disease and rejection of it [25].

Crises, such as the COVID-19 pandemic have shown that change is the only constant. Meditation and mindfulness can offer a helpful way to live with this constant change. Meditation apps and online classes can be recommended to patients. Both learning and having a regular meditation practice of our own can only benefit our patients and us. Meditation and mindfulness are useful skills that can help us sit with our fears and our circumstances and observe that, like our thoughts, they are passing through our lives [12, 26].

Due to the high volume of patients, those who have recovered should be examined and cared for in the long term, because over time, symptoms, such as self-illness, insomnia, and anxiety appear with post-traumatic stress, and it is necessary to deal with the remaining symptoms of the disease and reduce anxiety and depression after discharge, considering physical and psychological abilities. Discharge is not the point of overcoming the disease because reactivation of the virus and return of pulmonary symptoms, and post-traumatic stress disorder may be seen in these people.

As the pandemic subsides, long-term physical and psychological assessments are necessary for disease control.

A limitation of this study was that participants completed self-report and online survey responses. Individuals are potentially prone to socially desirable responses. The participants declared feeling less anxiety. Accurately restoring the psychological state of people before contracting the disease was impossible. And checking the amount of social support for people failed. As a result, it is recommended that new research be conducted, considering the constraints above to assess the therapeutic benefit of coordinated treatments by the therapist. These strategies should also be investigated in other diseases.

## 5. Conclusion

Considering the effect of MBCT on improving the resilience and psychological distress of those who have recovered from COVID-19, it is necessary to pay attention to the psychological rehabilitation of patients.

## Ethical Considerations

### Compliance with ethical guidelines

The survey was conducted with the approval of the Ethics Committees of the Islamic Azad University, Central Tehran Branch (Code: IR.IAU.CTB.REC.1400.031). All participants provided written informed consent after receiving a complete written description of the trial. The therapist has completed the MBCT techniques course at Moddat Institute of Higher Education (No.: 342978).

### Authors' contributions

All authors equally contributed to preparing this article.

### Conflict of interest

The authors declare no conflict of interest.

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