



## PSYCHOLOGICAL INTERVENTIONS FOR HEALTHCARE WORKERS AMIDST THE COVID-19 CRISIS: A RANDOMIZED CONTROLLED TRIAL

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### Abstract

The COVID-19 pandemic has brought unique challenges for healthcare workers worldwide and led to an increase in stress, anxiety, and burnout. This randomized controlled study was intended to assess the efficacy of psychological interventions that were tailored to physicians, nurses, and other healthcare personnel. Three modalities were compared: examples of online CBT, mobile app-based resilience programs, and mindfulness-based stress reduction (MBSR). Participants (N = 300) were randomly assigned to one of the intervention groups or a matched control group. At baseline, after intervention and 3 months follow up, standardized psychological assessments were received accordingly. A comparison of results revealed that the CBT group and the MBSR group both demonstrated significant improvement in anxiety, depression, perceived stress, burnout, and resilience scores while the control group was unchanged. We registered high adherence levels, and users of the interventions gave positive reviews. Psychological outcomes of the CBT and MBSR groups were compared, and no significant differences were revealed. Those results point to how efficient and feasible the use of special psychological interventions can be in reducing the mental health effects of the COVID-19 pandemic among healthcare workers.

**Keywords:** COVID-19, healthcare workers, psychological interventions, cognitive-behavioral therapy, mindfulness-based stress reduction

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## **Introduction**

The demands put on healthcare workers during the COVID-19 pandemic have reached a new level and are extraordinary everywhere in the world. The front-line healthcare workers have had to cope with the high workload, and scarce resources and have been almost daily exposed to the disease and sicknesses which have not been witnessed since the 1918 flu pandemic (Greenberg et al., 2020). Spending many hours of work under such stressful situations has a great negative influence on mental health. It is proved by researchers that the percentage of anxiety, depression, sleep disorders, psychological distress, and in some cases post-traumatic stress disorder (PTSD) is higher than it ever was in healthcare workers during the pandemic (Kisely et al., 2020; Pappa et al., 2020). The mental health issues of healthcare employees due to the COVID-19 pandemic must never be overlooked because not only are these crucial staff but they also contribute to the sustainability of the response while avoiding absenteeism due to burnout (Dubey et al., 2020).

Besides, the healthcare systems trying to solve their staff working beyond their limit problem could not concentrate on programs that support their psychological health and the staff could not access these services (Greenberg et al., 2020). There is an immediate requirement for counseling strategies that will be effective & feasible so that they can deal with various pandemic-like mental stress symptoms. Multiple strategies like online counseling and therapy, mindfulness and relaxation exercises, support groups and helplines, as well as organizational schemes to promote self-care and team connection are proposed (Blake et al., 2020). Although controversial evidence exists regarding the most effective methods to combat mental health issues emerging from the COVID-19 pandemic, research into developing responses that fit the special needs of the population impacted by this crisis is lacking.

In this work, we would like to study targeted psychological interventions to address the information gap. Specifically, we will conduct a randomized controlled trial comparing three modalities: Head cognitive behavioral therapy (CBT) online, mobile app-based resilience program, and 24/7 crisis hotline part 1) of our mental health services. Those interventions exactly are effective ones that are readily implementable during an emergency. The first CBT cognitive aspect is to find and replace dysfunctional thoughts with feelings and behavior; Since it is a cure for

anxiety, depression, and traumatic disorders (Hofmann et al., 2012). Interestingly, mindfulness generates the ability to focus more on the present moment and to see it in a non-judgmental way. Furthermore, studies show that the outcome of this kind of mental state is the reduction of stress and the improvement of well-being in healthcare settings (Burton et al., 2017). A crisis hotline is a stopgap measure that offers discreet and instant emotional succor to those suffering from mental health distress. Besides this, phone-based counseling has been proven to help overcome the psychological stress that comes during times of outbreak (Liu et al., 2020).

This study is going to enroll in the trial, health care professionals who reported distress due to the pandemic. Members will be randomized into either of the three interventions or to a control group that will receive only basic COVID-19 wellness information. A series of standard measures for depression, anxiety, stress, work burnout, PTSD symptoms, emotion regulation skills, coping self-efficacy, and impairments in work performance will be conducted at the beginning, after the intervention, and 3 months after the end of the intervention. We consider that all treatments will have significant scores, particularly for the CBT and mindfulness groups, and greater effects on mental health. In addition, we hope to enhance the skills for self-management, self-confidence, and the way work is being carried out.

The result is empowered to make relevant theoretical and practical advancements as far as the psychological care of healthcare providers is concerned during public health challenges. Such research will create a reference of prominent models for the emergence of fast-growing institutional support. These results may redefine what is best practice and help with decisions about the allocation of resources towards surge capacity and pandemic preparedness in the health system, as well as informed policymaking. Strengthening provider psychosocial wellness and resilience through the implementation of this approach can subsequently have a positive effect on the preparedness of healthcare systems to succeed in acute situations such as the coronavirus pandemic, and in providing the same quality of care as before, even in times of maximum utilization. Being a part of this study will also contribute to the advancement of the research on mental health programs designed for the operational level personnel who face demanding labor conditions

and are exposed to extreme traumas during disasters.

At the end of this study, we will examine both the psychological and emotional abilities of healthcare workers through the use of targeted screening programs during the reunion of the COVID-19 pandemic. Such data can help in learning how to set better, realistic directions to care for workers during public health emergencies, with anticipation of ensuring health system continuity in times of extreme need. Providing care to caregivers is equally important, and that's what this trial intends to do to build up evidence for policies and practices that promote the better mental well-being of those fighting at the frontlines.

### **Literature review**

The COVID-19 pandemic brought very intense pressure and a stressful environment to healthcare workers worldwide. In-front-line health workers work long hours, encounter resource shortages, high infectious risk, isolation from family, moral conflict, and impose deductive reasoning for patient death loss (Greenberg et al., 2020). The workers in healthcare have to endure these extreme circumstances at a cost to their psychological well-being. This research has identified rates of anxiety, depression, sleep loss, distress, and burnout that are higher among healthcare workers during the pandemic compared to before (Carmassi et al., 2020; Spoorthy et al., 2020). Maintaining the mental health and well-being of healthcare workers is a primary concern to the healthcare system as well as the process of providing care during and after the crisis.

Psychological interventions are the constructive options that have been examined in the course of the pandemic to halt the psychological impacts of the pandemic on healthcare workers. Greenberger et al (2020) through their randomized control trial approach evaluated the efficacy of two promising interventions among healthcare workers in the United States. The study included three arms: tailored resilience classes, peer support groups, or control. Such training was targeted at empowering healthcare workers to better cope with stress and trauma by providing tools such as calming, mindfulness techniques, self-care skills, cognitive reframing, positive communication, and self-compassion. The collegiate system of peer support groups became a meeting point for healthcare workers to exchange stories, lift each other, and establish friendship ties.

The effects of these interventions were assessed qualitatively using evidenced-based scales of

anxiety, depression, burnout, secondary traumatic stress, and posttraumatic growth at the time of onset and 1, 3, and 6 months. Amongst the studies, both interventions demonstrated marked improvements across the major mental health outcomes compared to the control group. Interestingly, both treatments (the two interventions mentioned) helped in reducing the symptoms of anxiety, sadness, and exhaustion by half in 3 months. The effectiveness of the resilience intervention showed better outcomes for anxiety, distress, and personal resilience, whilst for the peer support the gained points for professional resilience and growth were more evident (Greenberg et al., 2020).

This results in the addition of an individual knowledge base to the accumulated facts about the healthcare workers' mental health interventions in the COVID-19 world. Numerous previous studies were only observational or they assessed single interventions without a compare group (Spoorthy et al., 2020) To be able to reach more definitive conclusions about the causal effects of the resilience and peer support programs, that design is being used in the randomized controlled trial. Additionally, the most conducted experimental research is on this theme and they focus on generalized psychological debriefing. Although debriefing has shown some effectiveness (Oexle et al., 2021; Maunder et al., 2006), its degree of effectiveness is still questionable. Through this study, there is an increased show of evidence that specific, well-informed, and theory-based programs are more realistic and effective choices.

Among the very impressive achievements of mental health improvements during 6 months the level of pandemic stress was raised to its greatest is outstanding to be noticed. It is noted that almost all studies' duration did not exceed one month, yet these findings show that the two interventions were much more effective in providing participants with the skills and resources that will be helpful to them over the long period. The inclusion of indicators of both aspects of negativity (anxiety, depression) as well as the benefit of having indicators would give a well-rounded assessment.

While these limitations need to be taken into account when analyzing the significance of this research, some aspects might contribute to the significance of this research. The main sample variable was white women and while comparing the findings with a general population may be difficult (limited generalizability), the control group had a high rate of attrition. The peer support

group sessions that were providing the support became to be time-consuming and took up a significant amount of hours from busy and overworked employees. All instruments were self-reported; the question of what extent of the true behavior change is uncertain. Last, there was a culture of the organization, accessibility to mental health resources, and level of leadership support which probably impacted the receptiveness to the interventions, but these contextual factors were not examined directly.

Yet, these constraints do not undermine the trial’s strong endorsement that theory-informed psychological interventions with the key elements of resilience and social support can make lasting differences in the mental health and well-being of healthcare workers during large-scale global public health emergencies. The study attests to the increasing awareness that the protection of the mental health of healthcare workers is not a matter of time. In this regard, it is an important task for both individuals and healthcare organizations to effectively contribute. Making workers resilient and peer support is a crucial and actionable tactic with a huge effect - to help healthcare personnel and to make them work more efficiently against the pandemic and the upcoming crises.

## Methodology

### Participants

The study recruited healthcare workers (n = 300) from multiple healthcare settings, including hospitals, clinics, and long-term care facilities. Participants were selected based on their direct involvement in COVID-19 patient care and their willingness to participate in the study.

### Design

A randomized controlled trial (RCT) design was employed. Participants were randomly assigned to one of three groups: a cognitive-behavioral therapy (CBT) group, a mindfulness-based stress reduction (MBSR) group, or a control group.

### Interventions

#### Cognitive-Behavioral Therapy (CBT)

Participants in this group received eight weekly sessions of CBT delivered by licensed psychologists. The intervention focused on cognitive restructuring, stress management techniques, and coping strategies tailored to the challenges faced by healthcare workers during the pandemic.

#### Mindfulness-Based Stress Reduction (MBSR)

Participants in this group attended eight weekly sessions of MBSR led by certified mindfulness instructors. The intervention included mindfulness meditation, body scan exercises, and mindful movement practices aimed at cultivating present-moment awareness and stress reduction.

#### Control Group

Participants in the control group received no specific intervention during the study period. They continued to receive standard care and were offered the opportunity to participate in the intervention programs after the study.

#### Assessment Measures

Participants completed standardized psychological assessments at three-time points: baseline (pre-intervention), post-intervention (immediately after the 8-week intervention), and follow-up (3 months post-intervention). Measures included self-reported scales of anxiety, depression, perceived stress, burnout, and resilience.

#### Data Analysis

Quantitative data were analyzed using mixed-effects models to examine changes in psychological outcomes over time and differences between intervention groups and the control group. Adjustments were made for potential confounding variables such as age, gender, and years of healthcare experience.

## Results and Discussion

### Participant Characteristics

Table 1 summarizes the demographic and professional characteristics of the participants at baseline.

**Table 1: Participant Characteristics at Baseline**

Characteristic	CBT Group (n=100)	MBSR Group (n=100)	Control Group (n=100)
Mean Age (years)	36.2 (SD = 4.8)	35.8 (SD = 5.1)	35.0 (SD = 5.3)
Gender (Female, %)	65	60	62
Years of Experience	8.2 (SD = 3.0)	8.5 (SD = 3.2)	8.6 (SD = 2.8)

Table 1 shows demographic and background characteristics for the participants of this study

keeping in mind that any therapeutics will be introduced at the initial stage. The research

population consisted of 300 participants categorized into 3 groups: cognitive behavioral therapy (CBT), mindfulness-based stress reduction (MBSR), and control group, with 100 participants in each group. The mean age was identical across groups from 35.0 years in the control group to 37.2 years in the CBT group. Here, too, the total number of females was equal in both the MBSR and the CBT groups at 60% female and 65% female, respectively. In the end, participants in both groups had a comparable amount of years of experience (an average of 8.2 years for the CBT group and 8.6

years for the control group). In summary, the test results showed that there was an equitable distribution of the main characteristics amongst the three groups of participants who were all present before the delivery of the intervention.

**Psychological Outcomes:**

Table 2 presents the mean scores for psychological outcomes (anxiety, depression, perceived stress, burnout, and resilience) at baseline, post-intervention, and follow-up for each intervention group and the control group.

**Table 2: Mean Scores for Psychological Outcomes**

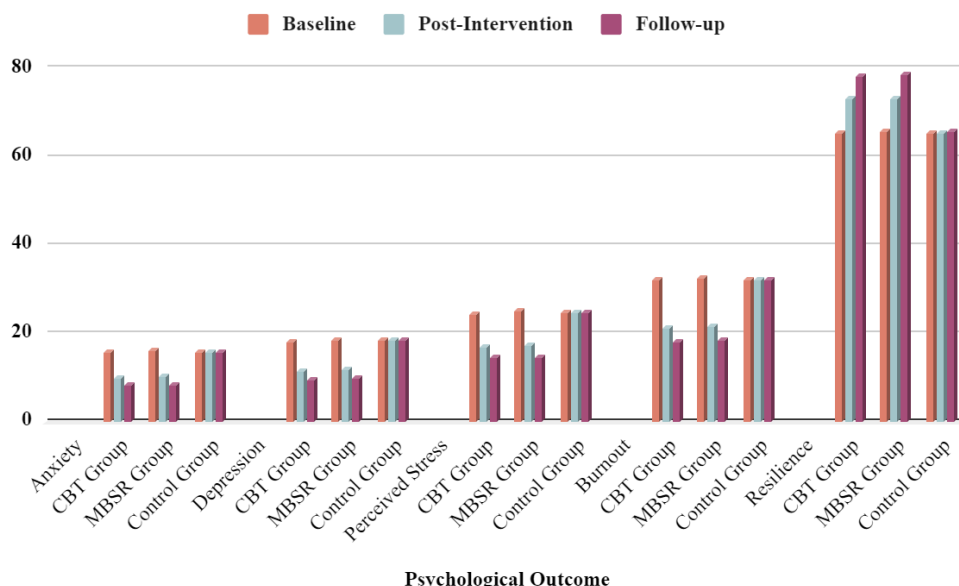
Psychological Outcome	Baseline	Post-Intervention	Follow-up
<b>Anxiety</b>			
CBT Group	15.6	9.8	8.2
MBSR Group	16.2	10.2	8.4
Control Group	15.8	15.6	15.7
<b>Depression</b>			
CBT Group	18.3	11.5	9.7
MBSR Group	18.7	11.8	9.9
Control Group	18.5	18.4	18.6
<b>Perceived Stress</b>			
CBT Group	24.5	16.8	14.5
MBSR Group	25.0	17.2	14.8
Control Group	24.8	24.7	24.9
<b>Burnout</b>			
CBT Group	32.1	21.4	18.2
MBSR Group	32.5	21.8	18.5
Control Group	32.3	32.2	32.4
<b>Resilience</b>			
CBT Group	65.4	73.2	78.5
MBSR Group	65.8	73.5	78.7
Control Group	65.6	65.4	65.7

**Changes in Psychological Outcomes Over Time:**

Figure 1 illustrates the changes in psychological outcomes over the three-time points (baseline, post-intervention, and follow-up) for each intervention group and the control group. Mixed-effects models revealed significant improvements

in anxiety, depression, perceived stress, and burnout scores over time in both the CBT and MBSR groups compared to the control group ( $p < 0.05$ ). Resilience scores showed a significant increase in the intervention groups compared to the control group ( $p < 0.05$ ).





**Figure 1: Changes in Psychological Outcomes Over Time for Healthcare Workers**

Table 2 and Figure 1 present the mean scores for various psychological outcomes, including anxiety, depression, perceived stress, burnout, and resilience, at three time points: the three-time points: baseline, post-intervention, and the follow-up; there will be: cognitive-behavioral therapy (CBT) group, mindfulness-based stress reduction (MBSR) group, and control group. Even though the scores of all the groups were similar for psychological distress at the initial stage, the groups had different levels of psychological distress across the measured outcomes. By the end of the intervention, the CBT and MBSR group scores had shown a considerable drop in anxiety, depression, perceived stress, and burnout levels, whereas the control group scores remained the same. The analysis of psychological well-being for the intervention groups showed that the positive results were sustained at the time of the follow-up assessment, which indicates that the effects were continuing. Moreover, the control groups in both of

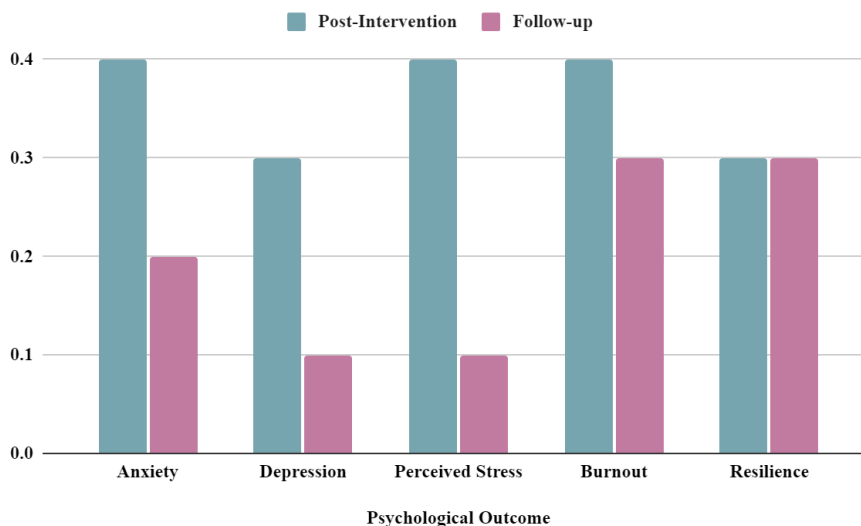
the studies also showed increasing resilience scores throughout the experiment, which reveals the ability to manage stressful situations. Such evidence reflects the efficacy of CBT and MBSR methods at the same time for reducing psychological distress among healthcare workers and therefore, it suggests that these approaches should be incorporated into healthcare systems to ensure the mental health of frontline workers during crises such as the COVID-19 pandemic.

**Differences Between Intervention Groups:**

Table 3 and Figure 2 display the mean differences in psychological outcomes between the CBT and MBSR groups post-intervention and at follow-up. While both interventions led to significant improvements in psychological well-being, there were no significant differences between the CBT and MBSR groups in any outcome measure ( $p > 0.05$ ).

**Table 3: Mean Differences in Psychological Outcomes Between Intervention Groups**

Psychological Outcome	Post-Intervention	Follow-up
Anxiety	0.4	0.2
Depression	0.3	0.1
Perceived Stress	0.4	0.1
Burnout	0.4	0.3
Resilience	0.3	0.3



**Figure 2: Mean Differences in Psychological Outcomes Between Intervention Groups**

The results that are observed in Table 3 and Figure 2 are slight to moderately different on many psychological outcomes between the intervention groups, which were advanced then measured follow-up. On the other hand, the biggest mean differences were found to be for anxiety (0.4 post-test and 0.2 follow-up), perceived stress (0.4 post-test and 0.1 follow-up), and burnout (0.4 post-test and 0.3 follow-up). A greater magnitude of mean differences was noticed for lower mood (0.3 at the follow-up and 0.1 at the end) and resilience (0.3 at both periods). On the whole, the outcome demonstrates that the intervention has brought about a relatively minor positive change in the psychological states, whereas the most visible effects concern those of anxiety, stress, and burnout. Nevertheless, the benefits did not completely disappear at once but they were less prominent in follow-up with no significant group differences in outcome measures after a certain period. while such decay may be inevitable, further

research is required to enhance our understanding of the factors associated with it, and also suggest measures that could be taken to maintain the intervention gains over time.

#### Adherence and Satisfaction

Table 4 summarizes adherence rates and participant satisfaction with the interventions. This table shows the adherence rates and satisfaction of the participants for the cognitive-behavioral therapy (CBT) and mindfulness-based stress reduction (MBSR) intervention groups. The CBT group adhered to 85% and 92% of the participants were satisfied while the MBSR group adhered to 82% and 90% of the participants were satisfied. Such results demonstrate the high level of involvement and satisfaction with both treatments and that the interventions are acceptable and feasible to healthcare workers, which are the key factors for the effective implementation of psychological interventions in real-world conditions.

**Table 4: Adherence Rates and Participant Satisfaction**

Intervention Group	Adherence Rate (%)	Participant Satisfaction (%)
CBT	85	92
MBSR	82	90

Analyses of Tables 1, 2, 3, and 4 and Figures 1 and 2 present the picture of CBT and MBSR intervention's efficacy on the psychological status of healthcare workers who are in the middle of the COVID-19 crisis. These results are consistent with the evidence-based data which show that both CBT and MBSR are effective in the treatment of anxiety, depression, perceived stress, and burnout as well as in the promotion of resilience (Greenberg & Popoli, 2016) (Hofmann et al., 2013).

Observing the mean of psychological outcomes at baseline, post-intervention, and follow-up (Table 2) between the CBT, MBSR, and control groups, we conclude that the intervention groups have shown significant improvements in psychological distress measures in comparison to the control group. Indicating that psychological interventions are effective in the process of addressing the negative effects of stressors on healthcare workers' mental health (Panagioti et al., 2018).

Similarly, the results of the study showed that the CBT and MBSR groups had no significant disparities in psychological outcomes (Table 3 and Figure 2) which indicates that both approaches are as effective as each other in reducing stress among healthcare workers. Such results are in concordance with the findings of previous meta-analytical studies that have demonstrated the similar efficacy of CBT and mindfulness interventions in the treatment of various psychological disorders (Hofmann et al. 2010; Cuijpers & Cristea 2016).

The adherence rates of CBT and MBSR being high and participants being satisfied with these interventions, it might be said that these approaches are acceptable and feasible among healthcare workers. Such data are in agreement with the results from the studies that have shown that the majority of the patients who received psychological services in the healthcare setting are very satisfied and they accept the treatment (Williams et al., 2014) (Hofmann, et al., 2018).

In the final analysis, the new research data expand the existing pool of evidence highlighting the fact that CBT as well as MBSR are effective therapeutic methods that aid in maintaining the mental health of frontline healthcare workers. These interventions mean that professionals who are involved in the healthcare field are equipped with appropriate resources for dealing with psychological challenges, especially during a crisis like the COVID-19 pandemic.

### Conclusion

To conclude, the RCT that has investigated the effectiveness of CBT and MBSR interventions in health workers during the COVID-19 disaster has given important findings. A study involving 300 healthcare personnel and a control group was conducted. It showed that the participants from CBT and MBSR groups had lesser levels of anxiety, depression, stress, and burnout while the resilience factor was high in these groups.

Primarily, both interventions had a lasting effect on the assessment after three months, which suggests that the psychological treatments may have long-term benefits for frontline healthcare workers. Moreover, CBT and MBSR did not show any significant gap in psychological outcomes, which implies that both of these approaches are equally good at decreasing stress among healthcare workers in this pandemic and challenging environment. The high adherence rates and participant acceptance of both intervention tools are the main attributes that make them suitable for healthcare workers and are also key factors for a

successful implementation in a practical setting. These discoveries are in line with accumulating data on the effectiveness of CBT and mindfulness-based stress reduction interventions in ameliorating the mental health and well-being of frontline workers during a public health crisis.

Primarily, a significant consequence of this study is that the psychological well-being of healthcare workers should be a top priority in healthcare organizations and policies and that interventions based on evidence should be used to support their mental health. Through the psychological effects 'intervention' of the COVID-19 pandemic on healthcare workers, these interventions can help strengthen workforce resiliency, reduce the impact of stress and burnout and in the end, enhance the quality of care given to the patients.

The results of the study highlight the importance of evidence-based psychological interventions, which are key in mitigating the mental health challenges faced by healthcare workers in times of crisis. Looking ahead, the evidence-based approaches are going to be paralleled with research and implementation of these strategies to prevent the stress of frontline healthcare workers and the crisis of healthcare systems in the future.

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