



Investigating the impact of modified mindfulness-based stress reduction (MBSR) program on occupational burnout and other mental health status among nonmedical staff in a hospital: a randomized controlled trial

Hourvash Haghiginejad¹ · Hamidreza Ghazipoor² · Peyman Jafari³ · Kaveh Taghipour² · Mehrdad Rezaie⁴ · Leila Liaghat² · Mani Ramzi⁵

Received: 27 February 2022 / Accepted: 14 June 2022

© The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2022

Abstract

Objective Burnout is a prolonged psychological response to a longstanding interpersonal stressor at work. It can progress to other mental illnesses, such as anxiety and depression. In today's society, burnout has become widespread, and it is currently a serious challenge in health systems. This study intended to investigate the impact of mindfulness training on burnout and depression, anxiety, and stress of nonmedical staff in a hospital in Shiraz-Iran.

Method Fifty nonmedical staff in a Shiraz-Iran hospital were enrolled in this two groups' randomized controlled trial. The intervention group was trained by a modified mindfulness-based stress reduction (MBSR) program, and the control group received no intervention. The outcome was assessed by the Copenhagen burnout inventory (CBI) and DASS-21 questionnaire on three occasions including before T0, immediately after T1, and 3 months after the intervention T2.

Results Comparing the score changes between intervention and control groups showed that the reduction of work-dis-taste-related burnout, client-related burnout, anxiety, and stress scores in the intervention group was significantly more than in the control group in the time interval from T0 to T1.

The scores in the intervention group in three subscales of CBI, including work-characteristic-related burnout, work-dis-taste-related burnout, and client-related burnout, decreased significantly immediately after the training (T1) compared to before (T0). Also, the scores did not change significantly after 3 months following training.

Conclusions Mindfulness training can be used as an effective way to improve occupational burnout, anxiety, and stress in occupations other than health professionals. Its effect is stable for at least a few months. It is recommended that future studies focus on investigating the feasible way to integrate this training into the working environment. Forthcoming studies should also determine whether the impact of this intervention will last longer and find possible ways to extend its influence.

Keywords Mindfulness intervention · Burnout · Depression · Anxiety · Stress · Nonmedical staff

Introduction

The term “Burnout” was first introduced by Freudenberg in 1974. This syndrome is caused by prolonged stress at work and consuming too much energy, effort, and resources which gradually lead to a change in psychological status (Peterson et al. 2008). It is a prolonged psychological response to a longstanding interpersonal stressor at work.

Maslach described dimensions of burnout as emotional exhaustion, depersonalization (negative reaction, devoid of feeling and with excessive indifference to service recipients), and decreased personal efficacy (Maslach and Leiter 2006). This psychological response to stress leads to a decreased sense of competence and success in the professionals, and it is more common in human service employees (Peterson et al. 2008). In today's society, burnout has become widespread and has taken over all aspects of people's lives (Grunfeld et al. 2000), and is currently a serious challenge in health systems (Mahmoud and Rothenberger 2019). Burnout is a spectrum that begins with occupational and mental

✉ Hourvash Haghiginejad
hhaghghi@sums.ac.ir

Extended author information available on the last page of the article

well-being and progresses to burnout as the stress process increases and prolongate and finally leads to anxiety, depression, and even suicide (West and Shanafelt 2007).

This syndrome is contagious, meaning that a person with burnout can soon influence a group of co-workers. Negative feelings of colleagues can be transmitted to each other through interpersonal communication (Meredith et al. 2020). For this reason, and due to the destructive effects that burnout can have on individuals' mental health, productivity, and performance, getting acquainted with practical ways to deal with stress and overcoming burnout can help improve mental health and increase the effectiveness of human resources (Binkley and Levine 2019). It is also necessary to identify and prevent its spread and acceleration in organizations (West et al. 2018).

Human resources are one of the most critical factors in health services in health sector development programs (Kazemian et al. 2014). Therefore, it is essential to pay attention to improving their performance. Hospitals usually account for about 50–80% of the health sector budget, and many professional and specialized personnel work in these large organizations (Abolhalaj et al. 2009). These organizations can be dangerous work environments. The hazards include not only exposure to a variety of toxins and chemicals or infectious agents but also work-related stress and tensions (Aziz et al. 2021). Working in hospitals can cause burnout, depression, and anxiety in hospital staff due to the high workload and interaction with many clients (Akbari and Kokabi 2011).

One method investigated to reduce burnout, and psychological stress is mindfulness-based stress reduction (MBSR) (Potter 2018). There are various definitions for mindfulness, but generally, it means awareness through focusing on certain objects and being present in the moment in a nonjudgmental manner (Kabat-Zinn 2009). These objects can be internal psychological states (focusing on images or thoughts), breathing or body position, or external stimuli (such as eating). The core of the mindfulness theory originates from Buddhism, which states that the root of all stress and mental problems is due to people's judgment of various phenomena by dividing them into good or bad experiences. Therefore, a healthy mind can be achieved through practicing to accept each moment without any judgment (Nykliček and Kuijpers 2008).

MBSR is a mindfulness-based program that has been used to help people with pain or a wide range of problems that are not suitable to be treated in a hospital setting. Professor John Kabat-Zinn developed the program at the University of Massachusetts Medical Center in the 1970s. A combination of mindfulness meditation, body awareness, and yoga was used in the MBSR program to help people increase mental awareness (Kabat-Zinn 1982; Pickert 2014). Classic MBSR is a standard mindfulness training program that consists of

8 weeks of group training sessions with 2–3 h duration once a week, 45 min of practice at home for 6 days/week, and a retreat session (7 h of mindfulness training) (Kabat-Zinn and Hanh 2009).

Modified versions of the MBSR program have been used in several studies instead of classic MBSR to make it practical for implementation (Cheung et al. 2020). This training program can reduce stress and improve the quality of life, but does not prevent or treat the underlying disorder (Meditation 2018)

Since its inception, the program has shown its impact on various psychological factors, including sleep quality, depression, anxiety, and quality of life, in many studies (Janssen et al. 2018; Rusch et al. 2019), but some have shown an equivocal effect on depression and anxiety (Toneatto and Nguyen 2007).

A systematic review study in 2018 examined clinical trials which investigated the effectiveness of the MBSR program and mindfulness-based cognitive therapy (MBCT) on employees. Overall, 23 studies were included in the review, of which 17 were of medium-to-high methodology quality. The results of studies suggested that MBSR may help improve employee psychological performance. However, due to the small number and quality of studies, it is impossible to draw accurate conclusions about the effect of these programs on different groups or in specific situations. The most substantial results showed a reduction in emotional fatigue (after burnout), stress, psychological distress, depression, anxiety, and job stress. It also included a significant increase in mindfulness, personal success and self-compassion (dimensions of burnout), sleep quality, and relaxation (Janssen et al. 2018).

Most studies investigated the impact of the MBSR method on the medical staff in western countries. Medical staff is more familiar with psychology, mental health problems, and job fatigue, and probably have a different approach to these conditions than people working in nonmedical professions. The systematic reviews included studies that have been conducted mainly on medical personnel in developed countries. Mindfulness has been studied in these countries and these target groups for many years, which can cause it to be less attractive. However, in developing countries, such as Iran, it has rarely been widely used in offices or workplaces to prevent or reduce employee burnout or stress. Therefore, public information about this issue is minimal. As a result, the limited knowledge of the general population compared to medical staff about mindfulness can affect its acceptance and effectiveness among nonmedical groups.

On the other hand, the dissimilar cultures of Iranian people from western countries may affect the acceptance of this type of training. In our Eastern culture, people are familiar with praying. Most of them have experienced this worship at some point in their lives, and many of them still pray

several times a day. This can lead to more acceptance of the mindfulness method. On the other hand, studies have shown that spiritual practices, such as prayer, mindfulness, and meditation, can all increase the blood flow in the frontal–parietal area of the brain. These brain areas are associated with cognitive control and the process of attention and emotion (Kober 2017). Therefore, it is possible that people who have engaged in each of these spiritual practices could better accept other similar methods, perform them better, and take advantage in a shorter time.

The present study tried to answer two main questions. V1: Does modified MBSR program training make a significant difference between the intervention and control groups in the level of burnout, stress, anxiety, and depression in nonmedical staff after training, and does this difference persist after 3 months? V2: Does MBSR program training make a difference in the level of burnout, stress, anxiety, and depression after training compared to before in the intervention group, and do these changes persist after 3 months?

The hypothesis of this study (H1) was that this type of training improves the level of burnout in personnel.

Materials and methods

This study is a two-arm parallel-group randomized controlled trial to compare outcomes (burnout, depression, anxiety, and stress) in two study groups on three occasions: before the first session of education was began (T0), after the last session was ended (T1), and 3 months after intervention (T2). Also, pre–post-analysis was conducted in each study group to compare these outcomes in T1 compared to T0 and T2 compared to T1.

Participants

Participants in this study were nonmedical staff of Al-Zahra Heart Hospital in Shiraz-Iran. The list of personnel was requested for recruitment from the hospital management office. Medical staff and nonmedical staff who were not in contact with patients or clients were excluded. Also, people who did not meet the inclusion criteria, such as a known case of psychiatric illness, were excluded from the list. Fifty individuals of nonmedical staff who had eligible criteria and consented to participate in the study were randomly selected from the remaining staff (Fig. 1).

The inclusion criteria of this study were: willingness to participate in the project; age between 17 and 70 years, having a nontherapeutic job; having a working relationship with visitors (patients/caregivers), and not undergoing treatment by other therapeutic methods. The exclusion criteria from

this study were: people who did not participate in two training sessions or more.

The sample size was calculated by PASS-11 to be 25 participants per group, based on our preliminary data with the standard deviation of 16 (Kristensen et al. 2005), type 1 error of 0.05, the effect size of 15, and power of 0.80, in the independent *t* test, and considering 20% missing data.

Procedure

The study adhered to the CONSORT guidelines for randomized trials (Boutron et al. 2008).

The intervention group was instructed by a modified MBSR program. All educational content (videos and lectures) was provided from the site <https://palousemindfulness.com>, and the researchers translated them to Persian.

The coaches were one family medicine resident and one nurse who had prior experience with MBSR program instruction. The family medicine resident had been trained for 2 months by a psychiatrist and a community and family medicine specialist who were professionals in MBSR training when he seemed to be ready to teach.

At the time of recruitment, all participants signed the informed consent. Then, they completed the Copenhagen burnout questionnaire, DASS-21 questionnaire, and a data collection form. Subsequently, the participants were randomly allocated into one of the two groups by block randomization given a block size of 2. For this purpose, the list of staff provided by the hospital was randomized based on a list created by an online randomization tool. This tool was used, because it simply provided a block randomization list (<https://www.sealedenvelope.com/simple-randomiser/v1/lists>).

The intervention group trained by a program consisted of one group education session per week for 4 consecutive weeks, and each lasted 1 h.

The educational content in each session was as follows. In the first session: the video of “Power of mindfulness” was presented to participants, then “Body scan” was taught to participants, and then, “Body scan” was practiced by participants for about 15 min. The second session consisted of: the video “Don’t try to be mindful” was presented, then the lecture “Why you find it hard to meditate” was introduced, and finally, participants meditated for approximately 15 min. The third session consisted of the video “Raisin meditation,” and then, 1–2 raisins were given to the participants and requested to practice “eating meditation” for approximately 15 min; subsequently, the lecture on “brain-rewires”. The fourth session consisted of: “Attention, intention attitude” video, then a lecture on “Sitting Meditation and Your mind,” finally, participants practiced sitting meditation for approximately 15 min.

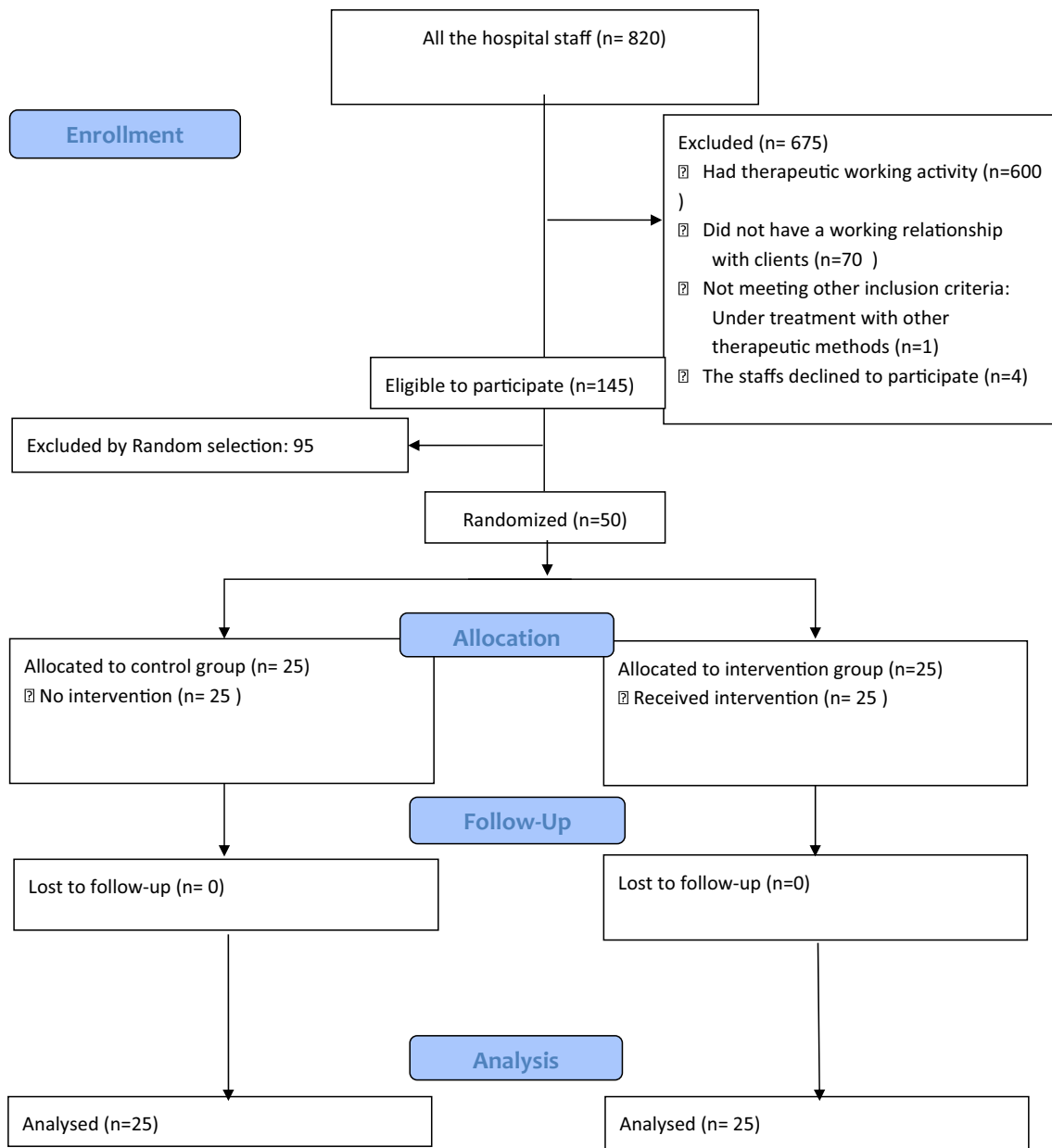


Fig. 1 Participants' flowchart. Own processing (2022)

Participants also practiced mindfulness for 15 min a day, 6 days/week at home, and reported their meditation practice time in the previous week in the next session. To reduce the complexity and simplification of the program, no booklets were given to participants for home training. Instead, they were asked to do homework based on the exercises learned in the sessions and the training videos presented in the sessions (the coach gave the files of these videos to participants.). After completing four training sessions, the participants were asked to continue their training, although no follow-up was done.

During this time, the control group received no intervention.

None of the hospital's work processes changed significantly during this study.

All participants in both groups completed the questionnaires on three occasions: before the first session of education began (T0), after the last session ended (T1), and 3 months after intervention (T2).

The statistician who analyzed the data and the data collector were blinded to participant study group allocation.

Measures

The data collection form included: demographic factors and job factors (age, level of education, working hours per week, and years working in the job) provided in annex 1. Two questions were asked from the intervention group about the impact of this training and their desire to continue these training sessions to examine the participants' point of view about this type of training.

Burnout

As most previous studies used MBI (Maslach burnout inventory) as burnout outcome measurement, a different scale, the Copenhagen Burnout Inventory (CBI), was used in the present study to investigate various aspects of burnout. The original version consists of 19 questions and examines the three factors of personal burnout, work-related burnout, and client-related burnout. The questions are scored as follows: always/very intense: 100%; often/intense: 75%; sometimes/somewhat: 50%; rarely/low: 25%; never/very low: 0. The total score on each scale is the average score of its items. The scale's internal consistency (Cronbach's alpha) was more than 0.85 (Kristensen et al. 2005).

The validity and reliability of the Persian version of CBI have been documented in a previous study (Mahmoudi et al. 2017). The analysis factor of the Persian version suggested a 4-factor model with factor loadings > 0.3. Four factors consist of personal burnout: 7 items, work-characteristic-related burnout: 3 items, work-distaste-related burnout: 3 items, and client-related burnout: 6 items. Its internal consistency in the four subscales ranged from 0.84 to 0.89, and the intra-class correlation coefficients for test–retest reliability were 0.83 to 0.95 (Mahmoudi et al. 2017).

Depression, anxiety, and stress

The depression, anxiety, and stress scale (DASS-21) contain 21 questions that assess the psychological structures of stress, anxiety, and depression. Scores were determined based on a four-choice Likert scale, not at all, low, medium, and high. The lowest score for each question was zero, and the highest was 3. The reliability and validity of the Persian version of the questionnaire were satisfactory. Internal validity for three subscales ranged from 0.77 to 0.79. Correlations between the DASS depression subscale and Beck Depression Inventory were 0.70, the DASS Anxiety subscale with Zang Anxiety inventory 0.67, and the DASS stress subscale with the Perceived Stress Inventory were 0.49 (Sahebi et al. 2005).

Data analysis

The results were entered into the SPSS 25 software by a statistician unaware of the study group allocation. Descriptive statistics, including percentage and frequency, and mean \pm standard deviation was used to describe the data. Repeated-measure analysis could not be applied in this study, because the prerequisite assumption (nonsignificant interaction between time \times group) was not met (P value < 0.05). Therefore, an independent sample t test was used to compare the mean differences of CBI and DASS-21 (depression, anxiety, and stress are other disorders in the burnout spectrum) between two groups at each time: before, after training of modified MBSR, and 3 months subsequently. Paired t test was used for pairwise comparison of means within the group. A P value less than 0.05 was considered significant. The effect size was calculated by Cohen's d . The value of effect size < 0.2, 0.2–0.49, 0.5–0.79, and > 0.8 is considered as negligible, small, moderate, and large, respectively (Cohen 2013).

The study protocol was approved by the research ethics committee of Shiraz University of Medical Sciences with an ethical code: IR.SUMS.MED.REC.1397.276 and was registered in the National Registry of Clinical Trials (<https://www.irct.ir/>) with IRCT Id: IRCT20190604043813N1.

Results

In this study, there were 25 participants in each group. All participated in 3 out of 4 training sessions in the intervention group, and two people (8%) did not participate in only one training session (Fig. 1). The mean age of participants in the intervention group was 36 years, and in the control group was 38 years. The control group consisted of 10 (40%) females and 15 (60%) males, and the intervention group of 16 (64%) females and 9 (36%) males. The difference in gender, age, level of education, work experience of more than 10 years, and working hours per week between the two groups was not significant (Table 1).

Impacts on burnout

Table 2 compares the mean score changes of the CBI subscales between the study groups (intervention and control) at the same time intervals. The changes under the work-distaste-related and client-related burnout subscales were significantly greater in the intervention group than in the control group at the T0–T1 interval. The effect sizes in both subscales are in the moderate range (between 0.5 and 0.79). The score changes from T0 to T1 in two other subscales were not significantly different between the two study groups.

Table 1 Demographic and baseline characteristics of the intervention and control groups. Own processing (2022)

Characteristics	Category	Frequency (percent)		P value
		Intervention group	Control group	
Gender	Men	9 (36%)	15 (60%)	0.09
	Women	16 (64%)	10 (40%)	
Degree of education	Diploma and post-diploma degree	8 (32%)	8 (32%)	1
	Bachelor's degree and higher	17 (68%)	17 (68%)	
Staff's job	Administrative Officer	11 (44%)	8 (32%)	
	Accountant staff	11 (44%)	12 (48%)	
	Driver	1 (4%)	0 (0%)	
	Facility staff	2 (8%)	4 (16%)	
	Medical equipment staff	0 (0%)	1 (4%)	
Working experience	10 years and less	15 (60)	9 (36)	0.09
	More than 10 years	10 (40)	16 (64)	
Personal burnout		35 ± 13.3	44.7 ± 19.9	0.06
Work-characteristic-related burnout		28.6 ± 20.7	39 ± 25.7	0.13
Work-distaste-related burnout		34.4 ± 17.3	39 ± 25.5	0.5
Client-related burnout		32.5 ± 18.4	21.5 ± 18.5	0.052
Depression		6.3 ± 7	8.2 ± 8	.4
Anxiety		6.2 ± 5.3	9 ± 6.7	.1
Stress		11.13 ± 5.7	12.4 ± 8.7	.55
Characteristics	Mean (standard deviation)		P value	
	Intervention group	Control group		
Age	36 (6.14)	38 (6.4)	0.2	
Working hours per week	49.5 (15.5)	53 (16.2)	0.4	

Table 2 Comparison of the mean scores' changes of the CBI subscales between the control and intervention groups in the two time periods: T1–T0 and T2–T1 (*t* test)

Subscale	Mean score different	Mean difference ± S.E		P value	95% Confidence interval of the difference		Effect size (Cohen's d)
		Control	Intervention		Upper	Lower	
Personal burnout	Mean score (T1)-Mean score (T0)	- 0.3 ± 3.9	- 2.6 ± 3.6	0.66	- 13	8.4	0.13
	Mean score (T2)-Mean score (T1)	6.7 ± 3.5	- 4 ± 2.7	0.02	- 19.4	- 2	0.66
Work-characteristic-related burnout	Mean score (T1)-Mean score (T0)	- 4 ± 4.5	- 11 ± 4.9	0.3	- 20.6	6.4	0.3
	Mean score (T2)-Mean score (T1)	9.7 ± 5.7	1 ± 3.9	0.22	- 22.7	5.3	0.35
Work-distaste-related burnout	Mean score (T1)-Mean score (T0)	3 ± 6.2	- 14.6 ± 4.8	0.03	- 33.5	- 1.7	0.64
	Mean score (T2)-Mean score (T1)	6 ± 4.8	1.3 ± 3.7	0.45	- 17	7.6	0.22
Client-related burnout	Mean score (T1)-Mean score (T0)	4.9 ± 3.7	- 8.14 ± 3.5	0.016	- 23.4	- 2.6	0.75
	Mean score (T2)-Mean score (T1)	8.5 ± 4.9	- 5.16 ± 5.2	0.06	- 28	0.6	0.54

Own processing (2022)

T0: Before training, T1: Immediately after completing the training, T2: 3 months after completing the training

CBI Copenhagen burnout inventory

The changes in scores between times 1 and 2 under the scale of personal burnout were significant, during which personal burnout decreased in the intervention group and increased in the control group.

The score changes from T1 to T2 in all other subscales were not significantly different between the two study groups.

Table 3 Comparison of mean scores of CBI subscales before training (T0) with scores immediately after training (T1) and immediately after training (T1) with 3 months after training (T2) in each of the control and intervention groups (paired *t* test)

Subscale	Time	Intervention group				Control group			
		Mean ± S.D	P value	95% Confidence interval of the difference		Mean ± S.D	P value	95% Confidence interval of the difference	
				Lower	Upper			Lower	Upper
Personal burnout	T0	36.5 ± 15	0.5	- 4.8	10	45.2 ± 20	0.94	- 7.9	8.5
	T1	33.8 ± 13				44.9 ± 18			
	T1	32.7 ± 13	0.15	- 1.4	9.5	44.5 ± 18	0.07	- 13.9	0.5
	T2	28.7 ± 11.6				51.2 ± 14.4			
Work-characteristic-related burnout	T0	31.6 ± 25	0.033	0.96	21.3	39 ± 25.8	0.4	- 5.4	13.43
	T1	20.4 ± 20.6				35 ± 22.8			
	T1	20.6 ± 20.14	0.8	- 9	7	35 ± 22.8	0.1	- 21.5	2.2
	T2	21.7 ± 19				44.7 ± 24.3			
Work-distaste-related burnout	T0	37.15 ± 21.6	0.006	4.5	24.6	39 ± 25.5	0.63	- 15.8	9.8
	T1	22.6 ± 19				42 ± 21.4			
	T1	22 ± 19	0.72	- 9	6.3	42 ± 21.4	0.22	- 15.9	4
	T2	23.3 ± 16				48 ± 22.6			
Client-related burnout	T0	32 ± 18.15	0.03	0.8	15.5	21.5 ± 18.5	0.2	- 12.6	2.8
	T1	23.9 ± 22.9				27 ± 18.3			
	T1	23.5 ± 21.5	0.33	- 5.5	15.9	27 ± 18.3	0.09	- 18.5	1.5
	T2	18.3 ± 15				35.5 ± 23.5			

Own processing (2022)
CBI Copenhagen burnout inventory

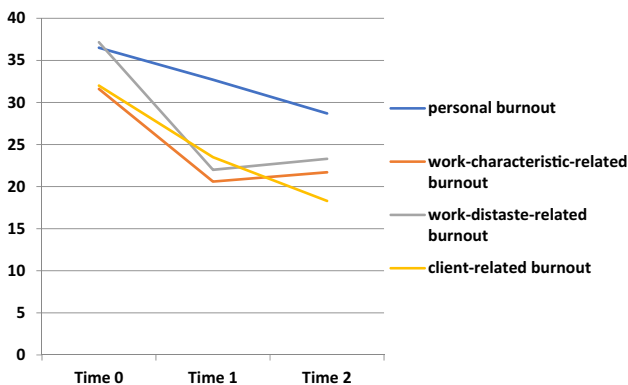


Fig. 2 The trend of the Copenhagen burnout inventory subscale scores at times 0, 1, and 2 in the intervention group. Own processing (2022)

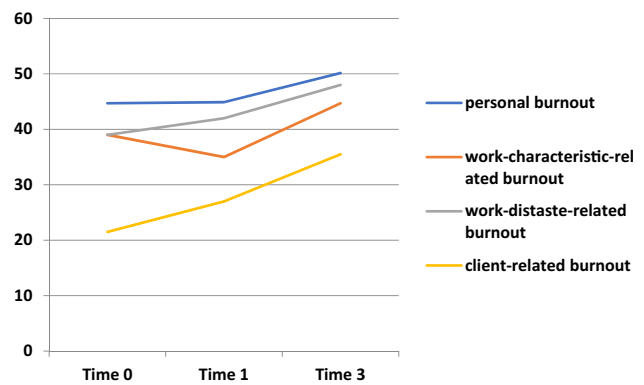


Fig. 3 The trend of the Copenhagen burnout inventory subscale scores at times 0, 1, and 2 in the control group. Own processing (2022)

As it has been shown in Table 3, the average scores in 3 sub-scale of CBI, including work-characteristic-related burnout, work-distaste-related burnout, and client-related burnout, decreased significantly after the training (T1) compared to before training (T0) (*P* value < 0.05). Personal burnout did not change significantly (*P* value > 0.05). As Fig. 2 shows, the scores declined from T0 to T1 in all subscales and have not changed significantly after 3 months in the intervention

group. In the control group (Fig. 3), the trend did not change significantly from T0 to T1, and after 3 months, although the changes were incremental, this increase was not statistically significant. (*P* value ≥ 0.05) (Table 3).

Table 4 Comparison of the mean scores' changes of the DASS-21 subscales between the control and intervention groups in the two time periods: T1–T0 and T2–T1 (*t* test)

Subscale	Mean score different	Mean difference \pm S.E		<i>P</i> value	95% Confidence interval of the difference		Effect size (Cohen's <i>d</i>)
		Intervention	Control		Upper	Lower	
Depression	Mean score(T1)-Mean score(T0)	-2 ± 1.5	1.1 ± 0.9	0.08	-6.7	0.4	0.5
	Mean score(T2)-Mean score(T1)	-0.4 ± 1.4	0.97 ± 2.2	0.62	-6.7	4	0.14
Anxiety	Mean score(T1)-Mean score(T0)	-2.3 ± 1.2	0.8 ± 0.86	0.04	-6.1	-0.15	0.6
	Mean score(T2)-Mean score(T1)	0.5 ± 1.2	-0.3 ± 2	0.73	-4	5.6	0.1
Stress	Mean score(T1)-Mean score(T0)	-2.2 ± 1.15	1.8 ± 0.7	0.005	-6.6	-1.2	0.83
	Mean score(T2)-Mean score(T1)	-2 ± 1	-0.08 ± 2	0.4	-6.5	2.6	0.25

Own processing (2022)

T0: Before training

T1: Immediately after completing the training, T2: 3 months after completing the training

DASS Depression Anxiety and Stress Scale

Table 5 Comparison of mean scores of DASS-21 subscales before training (T0) with scores immediately after training (T1) and immediately after training (T1) with 3 months after training (T2) in each of the control and intervention groups (paired *t* test)

Subscale	Time	Intervention group				Control group			
		Mean \pm S.D	<i>P</i> value	95% confidence interval of the difference		Mean \pm S.D	<i>P</i> value	95% Confidence interval of the difference	
				Upper	Lower			Upper	Lower
Depression	T0	6.2 ± 7	0.2	-1.2	5	8.2 ± 7.9	0.24	-1.53	0.41
	T1	4.2 ± 4.2				9.3 ± 8.6			
	T2	4.2 ± 4.2	0.8	-2.5	3.3	9.3 ± 8.6	0.67	-2.82	1.86
Anxiety	T0	6.2 ± 5.3	0.07	-0.17	4.8	9 ± 6.7	0.36	-1.29	0.49
	T1	3.8 ± 4.8				9.8 ± 8.2			
	T2	3.8 ± 4.8	0.7	-3	2	9.8 ± 8.2	0.87	-1.94	2.26
Stress	T0	11.13 ± 5.8	0.07	-0.2	4.6	12.4 ± 8.7	0.03	-1.64	-0.11
	T1	9 ± 5.2				14.2 ± 9.4			
	T2	8.8 ± 5.4	0.08	-0.2	4.2	13.7 ± 9.3	0.96	-1.65	2.69
	T2	6.8 ± 6.5				13.6 ± 7			

Own processing (2022)

Impacts on depression, anxiety and stress

Table 4 compares the mean score changes of the DASS21 subscales between the study groups (intervention and control) on three occasions. The scores' reduction in the intervention group was significantly more than the control group in anxiety and stress subscales of DASS-21 in the time interval from T0 to T1 (P value ≤ 0.05). The effect size was moderate for anxiety and large for stress subscales.

According to Table 5, in the intervention group, all subscales scores of the DASS-21 questionnaire after training (T1) were lower than before training (T0). Although no subscale score differed significantly, anxiety and stress subscale scores showed near significant reduction (P value 0.07). There was a significant increase in the mean scores of the stress subscale from T0 to T1 in the control group (P value ≤ 0.03). Scores did not change significantly from T1 to T2 in each study group and any subscale (P value > 0.05).

In response to two additional questions asked in the intervention group regarding participants' opinions about training sessions, 88% of people rated the effect of mindfulness meditation on reducing stress as moderate to high, and 92% wanted to continue the training sessions.

Discussion

In this study, participants were randomly allocated into two groups, the control and the intervention; the intervention group received MBSR training in a group session 1 h per week for 4 weeks and 15 min of mindfulness training at home. Immediately after the training, the results showed that the reduction of burnout in dimensions of "client-related" and "work-distaste-related" and decreased anxiety and stress scores in the intervention group were significantly more than in the control group. Also, mindfulness training reduced the average scores of burnout questionnaires in three dimensions immediately after compared to before training. After 3 months, this effect was sustainable, although the downward trend in reducing the average burnout score had not continued.

Mindfulness effects on burnout

Several studies previously investigated the effect of mindfulness training on burnout, which yielded different results. A systematic review study in 2020, which included 34 studies, showed that only four randomized controlled trial (RCT) studies proved the effectiveness of MBSR on burnout. Only one was rated as a "good" quality study. Five other RCT studies did not achieve statistically significant results. The quality of 3 of these studies was poor. Twenty-one studies in this systematic review did not have a control group. Overall, this systematic review study concludes that because the results are highly inconsistent and the quality of the studies was not satisfactory, there is still insufficient evidence to demonstrate the effect of mindfulness training on burnout (Klein et al. 2020).

Another systematic review that investigated the effect of MBSR on the mental functioning of healthcare professionals (including physicians, nurses, social workers, and psychologists) concluded that this method could improve anxiety, depression, and stress in healthcare workers. It can effectively reduce burnout, but it does not seem to be as effective as its impact on mood. This review included 30 studies, of which only 4 were RCT studies (Kriakous et al. 2021).

In the present study, an RCT study, although the MBSR training caused lesser effect size in burnout dimensions scores than anxiety score, which is compatible with previous investigations, it affected most burnout dimensions. Only

the personal burnout dimension did not change significantly compared to before the study or the control group.

Perhaps, one of the reasons for the impact of this education is related to our Eastern culture, which is more compatible with mindfulness theory.

On the other hand, unlike most previous studies, the target group in our research was the nonmedical staff who are less familiar with occupational burnout and the effect of mindfulness which can cause it to be more attractive in this group. In fact, the acceptance of this training method was high in our study population. As mentioned, 88% of people in the intervention group rated the effect of mindfulness meditation on reducing stress as moderate and high. Also, 92% wanted to continue the training sessions. These results may be further evidence of this claim that, perhaps, the novelty and attractiveness of this type of training in this group had caused its more significant impact.

Most studies in Iran have shown that this method effectively reduces burnout. However, many of these studies have not been conducted in a randomized controlled trial.

A study in Iran investigated the effect of mindfulness-based stress reduction (MBSR) on HIV/AIDS patients in a pre-post-study. MBSR training was conducted for eight weekly sessions; each session lasted 2 h. The program taught meditation skills, body examination, yoga, and sitting meditation. Patients' CD4 levels were measured before and after training and then at intervals of 3, 6, 9, and 12 months after training. In this study, the CD4 level was significantly higher than before treatment 12 months after training. The researchers concluded that the effect of MBSR on CD4 is present for at least 1 year, but due to the reduction of CD4 from the sixth month, it seems necessary to repeat the MBSR courses to maintain its effect (Jam et al. 2010). Also, in another pre-post-study, the impact of the MBSR program on marital burnout in married women has been evaluated, which indicates the positive effects of this training in reducing marital burnout compared to before the study (Moghadam et al. 2016).

In one randomized controlled study in Iran, addicted women were trained for eight sessions. The intervention group showed a significant difference in the score of the Couple Burnout Measure after training compared to before commencing the training program (Ghasemi Jobaneh et al. 2018).

Another reason for the difference in study results may be methodological issues. For example, a small RCT study by Duchemin et al. showed that mindfulness training in the two study groups, each consisting of 16 ICU personnel, did not cause a significant reduction in burnout, but a substantial decrease in the scores of DASS 21 by 25% compared to the control group was observed. The lack of significant changes in burnout in this study may be due to the small number of participants (Duchemin et al. 2015). Consequently, to

determine the effect of mindfulness training on individuals' mental and psychological conditions, the mental state and beliefs of the study population, the existence of a control group, and the number of training sessions are of particular importance.

One other difference in the present study compared with previous ones was using Copenhagen Burnout Inventory (MBI) to measure burnout. Most of the previous ones used the Maslach burnout inventory. This questionnaire may better show the changes in burnout.

Regarding the persistence of the effect of the MBSR on burnout, different results have been reported. A systematic review study (Kriakous et al. 2021) has shown that the impact of mindfulness training on reduction in burnout was stable from 3 months (Ducar et al. 2020) to 9 months (Schroeder et al. 2018) in various studies. Although one study reported that the decrease in burnout was not constant for 3 months following the intervention (Ceravolo and Raines 2019).

Similar to the majority of previous studies, our research also showed that the burnout score in any of the dimensions of the Copenhagen questionnaire did not change significantly 3 months after training compared to before training. In comparison, the control group showed an increase in scores in all dimensions, but these changes were not statistically significant. These results indicate the need for repetition and continuity of training to stabilize the effect of mindfulness training.

Mindfulness effects on stress, anxiety, and depression

As mentioned earlier, the impact of MBSR training on reducing anxiety, depression, and stress has been shown in various studies. The systematic review study showed that 18 out of 30 studies agreed on the effect of this type of mindfulness training on stress reduction (Kriakous et al. 2021).

In the present study, the changes in the anxiety and stress dimensions scores of the DASS-21 questionnaire were more significant than the control group. However, depression did not show a significant reduction after training. These results are consistent with most previous studies concerning anxiety and stress.

For example, in Dobie et al.'s study, depression did not significantly differ from before training (Dobie et al. 2016). There was no significant finding in Moody et al.'s (Moody et al. 2013) study about depression. Duarte et al. (Moody et al. 2013), concerning depression and anxiety in the intervention group, showed no significant difference. This finding is consistent with outcomes of depression in the present study. Perhaps, the reason for not changing the depression score in the present study is the low depression score of the

participants, which was in the normal range of normal (less than 9), so it did not change much after training.

Duration of training also is an essential factor. It was previously shown that even 2 days of training showed significant improvement in some aspects (but not all) of mental status. More training caused more improvement in mental state, especially for burnout (Kriakous et al. 2021). In most studies, as in our study, four training sessions weekly had a significant impact on psychological state.

Limitations

One of the limitations of our study was that it was not a multicentric trial. It is recommended that future investigations be performed in multiple centers with higher sample sizes. The other limitation is that MBSR coaches in this study were not certified in this method. Also, the time of training sessions was another limitation. The busy schedule of the hospital staff meant that the training time was usually after the hospital shift, and their fatigue probably reduced the effects of the training. Therefore, planning for this type of training and considering the right time will probably make it more effective.

Conclusion

The psychological response to stress leads to occupational burnout. This syndrome is caused by prolonged stress at work and consuming too much energy, effort, and resources, leading to a change in psychological status. It can progress to anxiety, depression, and even suicide, making it a serious challenge in the world today.

One method investigated to reduce burnout, and psychological stress is MBSR. Mindfulness means awareness through focusing on particular objects and being present in the moment in a nonjudgmental manner. Not judging can reduce stress. Given the importance of burnout not only in the health professionals but also in the general population, it is necessary to pay more attention to reduce it.

This randomized controlled trial investigated the effect of MBSR on burnout, stress, anxiety, and depression. Overall, 50 nonmedical staff in a hospital were allocated into two groups control and intervention. The outcome was assessed by CBI and DASS-21 questionnaires on three occasions: before, immediately after, and 3 months after completion of training. According to the present study results, this kind of training can cause a significant difference in the intervention group compared to the control group in terms of some dimensions of burnout immediately after the training. Also, it can drive more improvement in anxiety and stress scores in the intervention group

than in the control group. Likewise, mindfulness training reduced the average scores of burnout questionnaires in three dimensions immediately after compared to before training. After 3 months, this effect was sustainable, although the downward trend in reducing the average burnout score had not continued.

Although this study showed that the effects of this technique were sustainable after 3 months, future studies need to focus on the stability of the impact over a more extended period. Perhaps, to continue the improvement of mental status, it is necessary to repeat the training program in specific periods and find applicable methods for recall which should be investigated in future studies. It is also essential to consider these reminder methods' effective amount and frequency. Besides, it is recommended that future studies focus on investigating feasible ways to integrate this kind of training into the working environment.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s00420-022-01902-3>.

Acknowledgements The Vice Chancellor for Research at Shiraz University of Medical Sciences funded this project. Hamidreza Ghazipoor performed this research in partial fulfillment of the requirements for certification as a Family Medicine specialist at Shiraz University of Medical Sciences in Shiraz, Iran, under Grant Number: 97-01-01-16920. We also wish to acknowledge Alzahra Heart Hospital staffs who participated in this research. The trial protocol was registered in the Iranian Registry of Clinical Trials with IRCT Id: IRCT20190604043813N1.

Declarations

Ethical approval Ethics Committee of Shiraz University of Medical Sciences approved this study with ethical code: IR.SUMS.MED.REC.1397.276.

References



- Abolhalaj MHPSH, Jafari Sirizi M, Inanloo S (2009) Survey of human resources working in the country's hospitals in 2007. *J Shahrekord Univ Med Sci (shahrekord University of Medical Sciences Journal)* 12(1):60–68 (1389 [Cited 2021 June 01])
- Akbari F, Kokabi F (2011) Determining nursing manpower needed in a sample hospital. *Hosp J* 9(3):69–76
- Aziz TA, Amin RRH, Ahmed ZA, Sleman HJ, Aziz BH (2021) Occupational toxicity and health hazards of the healthcare providers at healthcare facilities in Sulaimani City, Iraq. *Iraqi J Pharm Sci* 30(2):41–49. <https://doi.org/10.31351/vol30iss2pp41-49>
- Binkley PF, Levine E (2019) Organizational strategies to create a burnout-resistant environment. *Clin Obstet Gynecol* 62(3):491–504. <https://doi.org/10.1097/GRF.0000000000000459>
- Boutron I, Moher D, Altman DG, Schulz KF, Ravaud P, Group* C (2008) Methods and processes of the CONSORT Group: example of an extension for trials assessing nonpharmacologic treatments. *Ann Intern Med* 148(4):60–66. <https://doi.org/10.7326/0003-4819-148-4-200802190-00008-w1>

- Ceravolo D, Raines DA (2019) The impact of a mindfulness intervention for nurse managers. *J Holist Nurs* 37(1):47–55. <https://doi.org/10.1177/0898010118781620>
- Cheung DSK et al (2020) The use of modified mindfulness-based stress reduction and mindfulness-based cognitive therapy program for family caregivers of people living with dementia: a feasibility study. *Asian Nurs Res* 14(4):221–230. <https://doi.org/10.1016/j.anr.2020.08.009>
- Cohen J (2013) *Statistical power analysis for the behavioral sciences*. Academic Press
- Dobie A, Tucker A, Ferrari M, Rogers JM (2016) Preliminary evaluation of a brief mindfulness-based stress reduction intervention for mental health professionals. *Australas Psychiatry* 24(1):42–45. <https://doi.org/10.1177/1039856215618524>
- Ducar DM, Penberthy JK, Schorling JB, Leavell VA, Calland JF (2020) Mindfulness for healthcare providers fosters professional quality of life and mindful attention among emergency medical technicians. *Explore* 16(1):61–68. <https://doi.org/10.1016/j.explore.2019.07.01>
- Duchemin A-M, Steinberg BA, Marks DR, Vanover K, Klatt M (2015) A small randomized pilot study of a workplace mindfulness-based intervention for surgical intensive care unit personnel: effects on salivary α -amylase levels. *J Occup Environ Med/am Coll Occup Environ Med* 57(4):393. <https://doi.org/10.1097/JOM.0000000000000371>
- Ghasemi Jobaneh R, Nazari A, Sanai Zaker B (2018) The effect of mindfulness training on reducing couple burnout of addict's wife. *J Res Health* 8(6):506–512. <https://doi.org/10.29252/jrh.8.6.506>
- Grunfeld E, Whelan TJ, Zitzelsberger L, Willan AR, Montesanto B, Evans WK (2000) Cancer care workers in Ontario: prevalence of burnout, job stress and job satisfaction. *CMAJ* 163(2):166–169
- Jam S, Imani AH, Foroughi M, Seyed ANS, Emadi KH, Mohraz M (2010) The effects of mindfulness-based stress reduction (MBSR) program in Iranian HIV/AIDS patients: a pilot study. *Acta Med Iran* 48(2):101–106
- Janssen M, Heerkens Y, Kuijer W, Van Der Heijden B, Engels J (2018) Effects of mindfulness-based stress reduction on employees' mental health: a systematic review. *PLoS ONE* 13(1):e0191332. <https://doi.org/10.1371/journal.pone.0191332>
- Kabat-Zinn J (1982) An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: theoretical considerations and preliminary results. *Gen Hosp Psychiatry* 4(1):33–47. [https://doi.org/10.1016/0163-8343\(82\)90026-3](https://doi.org/10.1016/0163-8343(82)90026-3)
- Kabat-Zinn J (2009) *Wherever you go, there you are: mindfulness meditation in everyday life*. Hachette Books
- Kabat-Zinn J, Hanh TN (2009) *Full catastrophe living: using the wisdom of your body and mind to face stress, pain, and illness*. Delta
- Kazemian M, Mahboobi AP, Meskarpour AM (2014) Assessment of physician human resources in Iran based on the goals of 1st-4th development plans. *Med Sch* 21(110):0–0
- Klein A, Taieb O, Xavier S, Baubet T, Reyre A (2020) The benefits of mindfulness-based interventions on burnout among health professionals: a systematic review. *Explore* 16(1):35–43. <https://doi.org/10.1016/j.explore.2019.09.002>
- Kober SE et al (2017) Ability to gain control over one's own brain activity and its relation to spiritual practice: a multimodal imaging study. *Front Hum Neurosci*. <https://doi.org/10.3389/fnhum.2017.00271>
- Kriakous SA, Elliott KA, Lamers C, Owen R (2021) The effectiveness of mindfulness-based stress reduction on the psychological functioning of healthcare professionals: a systematic review. *Mindfulness* 12(1):1–28. <https://doi.org/10.1007/s12671-020-01500-9>
- Kristensen TS, Borritz M, Villadsen E, Christensen KB (2005) The copenhagen burnout inventory: a new tool for the assessment of

- burnout. *Work Stress* 19(3):192–207. <https://doi.org/10.1080/02678370500297720>
- Mahmoud NN, Rothenberger D (2019) From burnout to well-being: a focus on resilience. *Clin Colon Rectal Surg* 32(06):415–423. <https://doi.org/10.1055/s-0039-1692710>
- Mahmoudi S, Atashzadeh-Shoorideh F, Rassouli M, Moslemi A, Pishgooie AH, Azimi H (2017) Translation and psychometric properties of the Copenhagen burnout inventory in Iranian nurses. *Iran J Nurs Midwifery Res* 22(2):117. <https://doi.org/10.4103/1735-9066.205958>
- Maslach C, Leiter M (2006) Burnout. *Stress Qual Work Life* 37:42–49
- Meditation (2018) *Cancer Research UK*. <http://about-cancer.cancerresearchuk.org/about-cancer/cancer-in-general/treatment/complementary-alternative-therapies/individual-therapies/meditation> [Last accessed 18 May 2018]
- Meredith C, Schaufeli W, Struyve C, Vandecandelaere M, Gielen S, Kyndt E (2020) 'Burnout contagion' among teachers: a social network approach. *J Occup Organ Psychol* 93(2):328–352. <https://doi.org/10.1111/joop.12296>
- Moghadam ZK, Nejjad SN, Ahmady K (2016) Examining the effectiveness of group mindfulness-based cognitive therapy on marital burnout in married women in mental and emotional dimensions of region 1 in tehran. *Int J Humanit Cult Stud* 1:2008–2016
- Moody K et al (2013) Helping the helpers: mindfulness training for burnout in pediatric oncology—a pilot program. *J Pediatr Oncol Nurs* 30(5):275–284. <https://doi.org/10.1177/1043454213504497>
- Nyklíček I, Kuijpers KF (2008) Effects of mindfulness-based stress reduction intervention on psychological well-being and quality of life: is increased mindfulness indeed the mechanism? *Ann Behav Med* 35(3):331–340. <https://doi.org/10.1007/s12160-008-9030-2>
- Peterson U, Demerouti E, Bergström G, Samuelsson M, Åsberg M, Nygren Å (2008) Burnout and physical and mental health among Swedish healthcare workers. *J Adv Nurs* 62(1):84–95. <https://doi.org/10.1111/j.1365-2648.2007.04580.x>
- Pickert K (2014) The art of being mindful. Finding peace in a stressed-out, digitally dependent culture may just be a matter of thinking differently. *Time* 183(4):40–46
- Potter D (2018) Palouse mindfulness: mindfulness-based stress reduction. Retrieved from pages at <https://palousemindfulness.com> [Last Accessed 22 May 2022]
- Rusch HL et al (2019) The effect of mindfulness meditation on sleep quality: a systematic review and meta-analysis of randomized controlled trials. *Ann N Y Acad Sci* 1445(1):5–16. <https://doi.org/10.1111/nyas.13996>
- Sahebi A, Asghari MJ, Salari RS (2005) Validation of depression anxiety and stress scale (DASS-21) for an Iranian population. *J Dev Iran Psychol* 1(4):50–60
- Schroeder DA, Stephens E, Colgan D, Hunsinger M, Rubin D, Christopher MS (2018) A brief mindfulness-based intervention for primary care physicians: a pilot randomized controlled trial. *Am J Lifestyle Med* 12(1):83–91. <https://doi.org/10.1177/1559827616629121>
- Toneatto T, Nguyen L (2007) Does mindfulness meditation improve anxiety and mood symptoms? A review of the controlled research. *Can J Psychiatry* 52(4):260–266. <https://doi.org/10.1177/070674370705200409>
- West CP, Shanafelt TD (2007) Physician well-being and professionalism. *Minn Med* 90(8):44–46
- West CP, Dyrbye LN, Shanafelt TD (2018) Physician burnout: contributors, consequences and solutions. *J Intern Med* 283(6):516–529. <https://doi.org/10.1111/joim.12752>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Authors and Affiliations

Hourvash Haghiginejad¹  · Hamidreza Ghazipoor² · Peyman Jafari³  · Kaveh Taghipour² · Mehrdad Rezaie⁴ · Leila Liaghat² · Mani Ramzi⁵

Hamidreza Ghazipoor
hamidghazipoor@gmail.com

Peyman Jafari
pjbiostat@gmail.com

Kaveh Taghipour
kaveh109@hotmail.com

Mehrdad Rezaie
md_rezaie@yahoo.co.uk

Leila Liaghat
liaghatl@yahoo.com

Mani Ramzi
ramzim@sums.ac.ir

¹ Department of Family Medicine, Hematology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

² Department of Family Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

³ Department of Biostatistics, Shiraz University of Medical Sciences, Shiraz, Iran

⁴ Department of Family Medicine, Department of Pediatric Medicine, Neonatology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

⁵ Department of Hematology and Oncology and Stem Cell Transplantation, Hematology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran