The Effect of Mindfulness-Based Stress Reduction Training on the Mental Health and Emotional Regulation of Emergency Medical Services Staff: A Randomized Clinical Trial

Sanaz Lotfi [1], Hamidreza Sadeghi-Gandomani [2], Mohammad Aghajani [3*]

Abstract

Background: Since Emergency Medical Services (EMS) staff face challenging and high-stress conditions, they experience various physical and emotional stresses, which can lead to emotional distress and threaten their mental health.

Aim: The present study was conducted with aim to examine the effect of mindfulness-based stress reduction training on emotional regulation and mental health of EMS staff.

Method: This randomized clinical trial study was conducted in 2022 on 60 EMS staff working at the Medical Emergency and Accident Management Center of Kashan University of Medical Sciences. The intervention group received 8 sessions of mindfulness training, while the control group received pamphlets on strategies for promoting mental health. The Difficulty in Emotion Regulation and Mental Health questionnaires were completed by the participants at the beginning, fourth, and eighth weeks after the study. The data were analyzed by SPSS software (version 16). $p<0.05$ was considered statistically significant.

Results: Immediately after the intervention and follow-up period, a significant difference was found between the two groups in terms of mean scores of mental health and difficulty in emotion regulation ($p<0.001$). Repeated measures ANOVA test showed that the effect of time on the mean scores of mental health and difficulty in emotion regulation was significant in the intervention group ($p<0.05$).

Implications for Practice: Considering the impact of mindfulness-based stress reduction training on improving mental health and emotion regulation, it can be used as an effective, non-invasive, and cost-effective method to promote mental health and emotion regulation of EMS staff.

Keywords: Emergency Medical Services, Emotion Regulation, Mental Health, Mindfulness-Based Stress Reduction

1. Master Student of Science, Student Research Committee, Faculty of Nursing and Midwifery, Kashan University of Medical Sciences, Kashan, Iran
2. Assistant Professor, Department of Nursing, Borujen Faculty of Nursing, Shahrekord University of Medical Sciences, Shahrekord, Iran
3. Assistant Professor , Infectious Diseases Research Center, School of Nursing and Midwifery,. Kashan University of Medical Sciences, Kashan, Iran

* Corresponding Author Email: aghajani1362@yahoo.com

Introduction

Emergency Medical Services (EMS) staff, as the first responders, are present in all kinds of emergency situations and, hence, experience various psycho-physical stresses regarding the stabilization of the conditions of patients until transfer to treatment centers (1). EMS staff need to make quick decisions and immediate treatment of patients to prevent death and permanent disability (2). The difficulty of thinking about all aspects of a situation at the moment can lead to numerous stressful reactions and create a lot of emotional turmoil in these personnel (3). On the other hand, human resources are one of the most important factors for achieving goals in organizations (4).

Emotion regulation refers to the ability to understand and express emotions and includes all conscious and unconscious strategies used to increase and maintain the emotional, behavioral and cognitive components of an emotional response (5). Uhreky argued that EMS staff use harmful emotion regulation strategies (6). Considering the rapid spread of emerging diseases such as COVID-19, dengue fever, Crimean-Congo fever, etc., EMS staff are exposed to direct contact with these diseases and experience significant psychological pressure related to the transmission of diseases to their family members (7,8).

Positive emotional regulation improves physical and mental health, strengthens social function and adaptation of the person, promotes interpersonal communication and reduces intrapersonal problems (9). On the contrary, emotional dysregulation decreases correct and timely decisions, has negative effect on their skills, leads to burnout and job dissatisfaction and, finally, threatens the lives of patients and the quality of the provided services (10). Moreover, EMS staff are often faced with extremely stressful situations, which usually lead to psychological stress in different dimensions, thereby threatening their mental health (11). Mental health means good feeling about themselves, acquire the necessary skills for effective communication, and manage their emotions (12). Several studies have reported high levels of mental health problems such as stress and anxiety among EMS staff (12, 13). In the study of Lai et al. (2020), the rate of depression and anxiety in the frontline treatment personnel during the Covid-19 pandemic was 50% and 44%, respectively (14). Prolonged and continuous workplace stresses can lead to resignation, frequent absences, depression and work exhaustion (15, 16).

One of the central processes of having mental health is the ability of regulating one's emotions (17). In this regard, Bamonti (2019) believe that any defect in the regulation of emotions can make a person vulnerable to psychological problems, including depression and anxiety (18). Various methods such as cognitive behavior therapy (CBT) (19) and dialectical behavior therapy (DBT) (20) have been used to regulate emotions and improve mental health. One of the psychological interventions used to reduce mental health problems is the mindfulness-based stress reduction (MBSR) program (21). MBSR is a behavioral intervention based on which people learn to develop acceptance and compassion instead of judging their experiences, create moment-to-moment awareness instead of automatic guidance, and improve new ways of responding to situations and accepting unpleasant emotions or painful stimuli (22). Wylde et al. (2017) in their study reported that MBSR reduced burnout and increased mindfulness and compassion in nurses (23). However, Duarte et al. (2017) indicated that MBSR did not improve the symptoms of anxiety and depression in nurses (24).

Most of the previous studies have focused on nurses and inadequate attention has been paid to EMS staff. In addition, contradictory results have been reported regarding the impact of MBSR on various aspects of health (24, 25). Moreover, previous studies had several limitations, such as small sample size (26, 27), high sample drop (28), short duration of intervention and no follow-up period to check the stability of the results (3, 29). Therefore, the present study was conducted with aim to examine the effect of mindfulness-based stress reduction training on emotional regulation and mental health of EMS staff.

Methods

This randomized clinical trial study was conducted in 2022 on EMS staff working at the Medical Emergency and Accident Management Center of Kashan University of Medical Sciences. The inclusion criteria were not suffering from a known physical and mental illness, not taking mood-stabilizing medication in the last 3 months, no participation in mindfulness courses in the last 6 months, being employed, having at least 6 months experience of working in the pre-hospital emergency, and obtaining a score of ≥21 from the general health questionnaire at the beginning of the

study. The participants were excluded from the study if they were absent in more than 2 mindfulness sessions, if there was no access to their follow-up stages of mental health status and emotional regulation, and if they started to take mood-stabilizing medications. The sample size was estimated to be 25 subject based on a previous study (30) and considering α=0.05 and β=0.2, effect size=0.85, allocation ratio n2/n1=1, and through G-power software; but, considering the possibility of sample drop, 30 subjects were selected for each group and finally, 60 participants were analyzed. First, the necessary explanations were given by the researcher to the eligible participants and informed consent was obtained. Then, the questionnaire of demographic information and the scale of general health and emotional regulation were completed by them as self-report.

The general health questionnaire developed by Goldberg (31) contains 28 questions that are scored based on a 4-point Likert scale ranging from 0 to 3. The total score ranges from 0 to 84, and the lower score indicates the higher general health. The validity of the questionnaire was checked and confirmed in a study in Iran and its reliability was calculated to be 0.89 by using the Cronbach's alpha (32).

Difficulties in emotion regulation scale (33) is a 36-item questionnaire that evaluates a person's emotional regulation insufficiency and is scored based on a 5-point scale ranging from 1 (almost never) to 5 (almost always). The total score of the scale is between 36 and 180. The higher score indicates a greater difficulty in emotion regulation (34). The validity of the scale has been examined and confirmed in previous studies. Based on the study of Azizi et al. (2011), the reliability of the tool was checked by calculating the internal consistency, and its Cronbach's alpha was estimated to be 92% (26).

The samples were allocated to each of the intervention and control groups based on the Sealed Envelope Ltd. 2017 that is available in the website www.sealedenvelope.com. Therefore, the study samples were arranged in 10 blocks of 6 in two groups of 30 individuals, selected based on the table of random numbers, and the subjects were assigned to the groups based on the conditions of the blocks. After identifying the members of the groups through random allocation, group training intervention was performed in the emergency center for the subjects of the intervention group in the form of small groups (2-8 subjects) during 8 sessions of 60-90 minutes (2 sessions per week with an interval of at least two days) by the second author, who had undergone MBSR training. Considering the Covid-19 pandemic, the health protocols were observed and the sessions were held in the training room of the center, which had proper ventilation and temperature.

The intervention group received the mindfulness training program designed based on Kabat-Zinn (2003) protocol. The first session started with welcoming the members, establishing a therapeutic relationship with the members, determining the goals and expectations of therapy and group rules, providing explanations about the nature of mental health and the ability to regulate emotions and its effects on the dimensions of their lives, a brief introduction to mindfulness, training of awareness in daily activities, body check, short breathing, and presenting homework worksheets (Table 1).

Table 1. The outline of the MBRS intervention

Session	Contents
1	An introduction with MBSR, its preparations, components, and common effects. Body scanning, sitting meditation and eating meditation.
2	Checking homework assignments, teaching the technique of breath awareness and 10 minutes of mindful breathing, conducting seated meditation, providing homework handouts.
3	Checking homework assignments, practicing brief seeing and listening, practicing mindful breathing, practicing conscious movements, conducting seated meditation, providing homework handouts.
4	Checking homework assignments, five-minute exercises in seeing and hearing.
5	Three-minute practice, practicing the STOP technique for stress management, providing homework handouts.
6	Practicing mindfulness in everyday relationships; Presentation of homework worksheets
7	Checking homework assignments, teaching the impact of mindful states in meditation practice.
8	Checking homework assignments, completing meditation; an overview of the teachings presented throughout all previous sessions.

The educational content of the in-person sessions was taught by lecture, group discussion, question and answer, and the practice of skills through PowerPoint, video, and clip. Moreover, a group was created in virtual space for meditation, question and answer, and homework follow-up. Additionally,

the researcher contacted the participants once a week to follow up their assignments. At the end of each session, the participants were appreciated, the contents of the session were reviewed, the topic of the next session was introduced and they were asked to be prepared for the next session. Then, the participants were gladly dined, the time and title of the next session was offered to them, and the sessions ended by appreciating the participants for their presence. The control group did not receive any intervention other than a pamphlet on mental health solutions prepared by the NANDA International Association. Four weeks after the end of the intervention and 8 weeks after the start of the study, the mental health and emotional regulation questionnaire was again completed by the two groups.

Data were analyzed by SPSS software (version 16) and using descriptive statistics (mean and standard deviation) and inferential statistics. The normality of the quantitative data was determined using the skewness and kurtosis indices in the positive and negative range of 2. Inferential tests (chi-square test and exact chi-square test for comparing the status of demographic and background variables categorized in the study groups) and one-way repeated measures ANOVA were used to investigate the general health and emotion regulation during the 3 points of time for measuring the variables in each group and between the two groups and to check the general health and emotional regulation between the two groups. Independent t-test was also used to investigate the general health and emotional regulation between the two groups. $p<0.05$ was considered as the significant level. It should be noted that the study data were analyzed by a person who was blinded to the study groups.
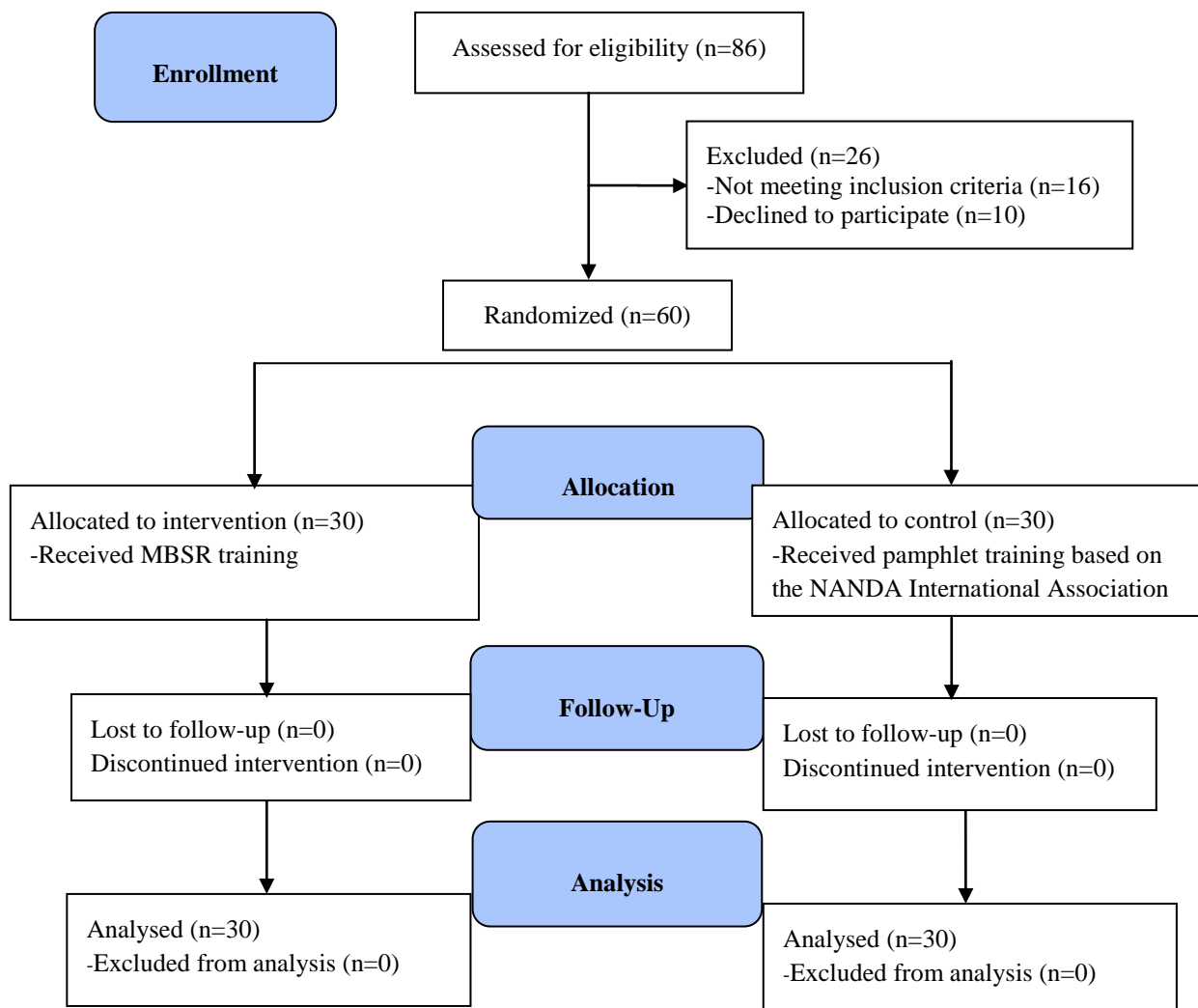

Figure 1. CONSORT Flow diagram of the study process

Ethical Consideration

This project was approved by the Research Ethics Committee of Kashan University of Medical Sciences (ethical code: IR.KAUMS.REC.1400.056) and was registered in the Iranian Registry Clinical Trial site (IRCT20130721014086N15).

Results

A total of 60 participants in the intervention (n=30) and control (n=30) groups entered the final analysis (Figure 1). There was no statistically significant difference between the two groups in terms of demographic characteristics (Table 2).

Table 2. Demographic characteristics of participants in the intervention and control groups

Variable	Intervention N(%)	Control N(%)	Test result	P-value
Sex				
Male	1(3.3)	1(3.3)	χ^2=0.63	1.00[*]
Female	29(96.7)	29(96.7)		
Marital status				
Single	8(26.7)	9(30)	χ^2=2.16	1.00[*]
Married	22(73.3)	21(70)		
Level of education				
Bachelor	25(83.3)	24(80)	χ^2=0.25	1.00[*]
Associate degree	5(16.7)	6(20)		
Experience of work (Mean ± SD)	9.30±6.79	11.43±7.34	t=1.16	0.24[**]
Age (Mean ± SD)	33.07±8.52	35.57±7.42	t=1.21	0.23[**]

*Chi-square; **Independent t-test

Repeated measures ANOVA showed that the effect of time on the mean score of mental health was significant in the intervention group. In other words, there was a statistically significant difference between the mental health scores at three time intervals ($p<0.001$). In the pairwise comparison made by the Bonferroni statistic, it was found that in the intervention group, there was a significant difference between the mental health score before the intervention and immediately after the end of the intervention ($p<0.001$), as well as before the intervention and the follow-up period ($p<0.001$). However, in the intervention group, there was no significant difference between the mental health score immediately after the intervention and the follow-up period ($p=0.560$). Based on the results of the t-test, there was no significant difference between the two groups in terms of maternal health scores before the intervention ($p=0.120$). However, there was a difference between the two groups maternal health scores immediately after the end of the intervention ($p<0.001$) and the follow-up period ($p<0.001$) (Table 3).

Variance analysis with repeated measurements showed that the effect of time on the average score of mental health was significant in the control group. There was a statistically significant difference between the mental health scores at three time points ($p<0.0001$). A significant difference was found between the mental health score at the beginning of the study and the fourth week in the control group using the Bonferroni statistic ($p<0.0001$), but this difference was not significant with the follow-up period (p=0.056). Also, a significant difference was found between the second and third periods ($p<0.0001$).

Repeated measures ANOVA showed that time had a significant effect on the mean score of difficulties of emotional regulation. There was a statistically significant difference between the scores of emotional regulation difficulty at the three time intervals (P<0.008). Based on the pairwise comparison made by the Bonferroni statistic, in the intervention group, there was a significant difference between the emotional regulation score before the intervention and immediately after the end of the intervention ($p<0.025$). However, in the control group, the score of emotional regulation difficulty before the intervention was not significantly different from it

immediately after the intervention and the follow-up period ($p>0.05$). As the results of t-test revealed, there was no significant difference between the two groups in terms of emotional regulation difficulty before the intervention ($p=0.220$). However, there was a significant difference between the two groups in terms of emotional regulation difficulty immediately after the end of the intervention ($p<0.001$) and the follow-up period ($p<0.001$) (Table 4).

Variance analysis with repeated measures showed that in the control group, the effect of time on the mean score of emotional regulation difficulty was significant. There was a weak statistically significant difference between the emotional regulation difficulty scores at three time points ($p<0.03$). In the pairwise comparison made with Bonferroni's statistic, no significant difference was found between the emotional regulation score at three time points in the control group ($p>0.05$).

Table 3: Comparison of mental health scores at three time points in the intervention and control groups

Mental health score	Intervention N=30	Control N=30	Comparison between groups[**]			Interaction of time and group[*]		
			Mean Difference	Mean Differences CI 95%		Mauchly's test	Sphericity Assumed	p-value
				Upper limit	Lower limit			
At beginning of the study (T1)	52.43±3.24	50.93±4.19	1.50	3.43	-0.043			0.12
4th week of the study (T2)	16.80±2.59	55.87±3.28	-39.06	-37.53	-40.59	$\chi^2=0.92$ $p=0.11$	F=715.15 $p<0.001$	<0.001
8th week of the study (T3)	17.47±3.39	48.93±3.73	-31.46	-29.62	-33.30			<0.001

*Analysis of variance with repeated measures, **Independent t-test

Table 4: Comparison of difficulties of emotional regulation scores at three time points in the intervention and control groups

Difficulties of emotional regulation scores	Intervention N=30	Control N=30	Comparison between groups[**]			Interaction of time and group[*]		
			Mean Difference	Mean Differences CI 95%		Mauchly's test	Sphericity Assumed	p-value
				Upper limit	Lower limit			
At beginning of the study (T1)	74.97±7.25	76.80±3.90	-1.83	1.18	-4.85	$\chi^2=0.87$ $p<0.02$	F=8.23 $p<0.001$	0.22
4th week of study (T2)	68.37±9.92	73.23±5.76	2.20	-7.51	-16.34			<0.001
8th week of study (T3)	73.23±5.76	79.16±6.05	-5.93	-2.87	-8.98			<0.001

*Analysis of variance with repeated measures, **Independent t-test

Discussion

The purpose of the present study was to examine the effect of mindfulness-based stress reduction training on mental health and emotional regulation of EMS staff. Based on the results of the current study, four weeks after the intervention and in the follow-up period, the mean mental health score in

the intervention group was significantly lower than that of the control group. In other words, the mental health of the intervention group improved after the intervention. Moreover, the intra-group comparison indicated that the mental health of the intervention group after the intervention and in the follow-up period improved significantly compared to the beginning of the study. In line with the results of the present study, Lu et al. (2019) in an interventional study on psychologists providing patient care services found that 8 weeks after the intervention, MBSR led to a reduction in sleep problems, depression, and anxiety in the intervention group (35). Similarly, in the study of Ducar et al. (2019) on pre-hospital emergency personnel, the weekly implementation of eight 2.5-hour MBSR sessions resulted in a significant reduction in the perceived stress and burnout in the intervention group immediately, 3 months and 6 months after the intervention (27). In the semi-experimental study of Saberinia et al. (2018), a mindfulness-based cognitive therapy program during eight 90-minute sessions reduced the anxiety of pre-hospital emergency personnel in the intervention group (28). Similarly, Duchemin et al. (2015) found that the implementation of seven 1-hour MBSR sessions for the intervention group significantly reduced the stress of the intervention group personnel immediately after the intervention (36).

Mindfulness training helps pre-hospital emergency personnel to deal with their fearful experiences. They learn not to avoid being aware of their bodily sensations and thoughts in order to stay safe from harms. Mindfulness helps people to be absorbed in the present moment instead of being preoccupied with the past or the future and avoid thinking about immediate future goals. Additionally, mindfulness makes a person perceive a situation as it is and have a better quality of life and enjoy it, and keep themselves safe from the disturbance of disappointing and anxiety-provoking thoughts that may affect their mental health.

In the current research, the findings of the intragroup comparison in the control group revealed a significant difference in the score of mental health between the beginning of the study and the fourth week and then between the fourth week and the eighth week. An increase was observed in the score during these two times, that is, the mental health score was reduced in the control group. This finding is probably due to the working conditions and the pressures of the Covid-19 pandemic, and emphasizes the need for effective interventions in the area of mental health. It can be said that muscle relaxation techniques, deep breathing, and other techniques used in this method can reduce anger, anxiety, and symptoms of arousal, thereby improving one's mental health.

Based on the results of the present study, the mean emotional regulation score of the intervention group in the fourth week and the follow-up period was significantly lower than that of the control group. It means that an improvement was observed in the emotional regulation of the personnel after the intervention. Although a significant improvement was observed in the intervention group four weeks after the intervention, during the follow-up period, this difference was not significant compared to the beginning of the study and after the intervention. The impact of MBSR on emotional regulation was not significant over time; it seems that there is a need to implement a similar intervention with a greater number of training sessions. In this regard, Chiodelli et al. in their interventional study indicated that the weekly implementation of 6 mindfulness sessions significantly decreased the mean score of emotional distress in final year undergraduate students of various fields of study in Brazil (37). Similarly, Zhang et al. (2019) conducted an interventional study on psychologists providing patient care services and found that the weekly implementation of eight 2-hour MBSR sessions improved the negative emotions of the intervention group four weeks after the intervention (38). Schroeder et al. (2018) in a study on the physicians who provided primary care found that 13 hours implementation of MBSR along with a 2-hour follow-up session improved emotional exhaustion and depersonalization and reduced stress immediately after the intervention in the intervention group (39). Fortney et al. (2013) in their clinical trial study on practicing doctors and nurses found that the implementation of 14 hours MBSR in one week followed by two 2-hour follow-up sessions significantly improved emotional exhaustion, depersonalization and personal success, stress, anxiety and depression in the intervention group immediately and 9 months after the intervention (40). To explain this agreement, it can be inferred that mindfulness training encourages people to observe and accept their emotional experiences without any effort to change them. Facing negative emotions in this way can probably reduce any reaction to stress. In this regard, people are encouraged to see their emotions as transient events that do not require maladaptive behaviors and reactions. This generalized view of emotions prevents re-experiencing emotional reactions that improve their mental health

through reducing their stress, anxiety and psychological problems.

Mindfulness-based stress reduction makes subjects creatively respond to their current situation and free themselves from abnormal reactions. Physical examination exercises increase the sensitivity of receiving body messages and reduce the reception of mental disturbances by making the subjects directly feel their body. In this way, the Emergency Medical Services (EMS) staff can continue their normal life and have a natural emotional regulation despite experiencing these emotions and terrible feelings. One of the limitations of this study was the non-cooperation of the subjects of the intervention group to attend the training sessions and respond to telephone follow-ups, which was reduced to a large extent by holding a briefing session and explaining the significance of the study.

Implications for practice

As shown by the results of this study, MBRS can positively improve the mental health and emotional regulation of EMS staff. This technique can be used as an efficient, non-invasive and cost-effective method to improve the mental health and emotional regulation of EMS staff.

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Conflicts of interest

The authors declared that they have no competing interests.

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Authors' Contributions

Hamidreza Sadeghi-Gandomani: Conceptualization. Mohammad Aghajani: Methodology, Data gathering and analysis, Supervision, Writing–review & editing. Hamidreza Sadeghi-Gandomani and Sanaz Lotfi: Writing–original draft. All authors contributed to the writing of the manuscript and discussed on the manuscript.

References

1. Davey A, Sharma P, Davey S, Shukla A. Is work-associated stress converted into psychological distress among the staff nurses: A hospital-based study. Journal of family medicine and primary care. 2019;8(2):511-6.

2. Donnelly E, Siebert D. Occupational risk factors in the emergency medical services. Prehospital and disaster medicine. 2009;24(5):422-9.

3. Moukarzel A, Michelet P, Durand AC, Sebbane M, Bourgeois S, Markarian T, et al. Burnout syndrome among emergency department staff: prevalence and associated factors. BioMed research international. 2019: 2019 (1); 6462472.

4. Rasouli D, Ahmady S, Zenozi SM, Rozveh AK. Effectiveness of nursing virtual training courses based on the Kirkpatrick Model. Journal of Education and Health Promotion. 2023;12(1):203. doi: 10.4103/jehp.jehp_913_22

5. Gross JJ. Emotion regulation: Current status and future prospects. Psychological inquiry. 2015;26(1):1-26.

6. Uhrecký B, Gurňáková J, Baránková M. Emotion regulation strategies in paramedic crew leaders during a simulated stressful Task: A qualitative inquiry. Studia psychologica. 2020;62(2):89-108.

7. Karami Rajabpoor A, Gheiasi SF, Amini K, Rabie Siahkali S. Moral Courage and Its Related Factors in Emergency Medical Technicians during the Covid-19 Pandemic in 2021: A Cross-sectional Study. Evidence Based Care. 2022;12(3):7-15.

8. Asadi Aghajari M, Fazlizade S, Hashemzadeh E, Ojaghloo M, Ghanbari-Afra L, Ghahremani Z, et al. The Relationship between Occupational Stress and Depression in Emergency Medical Technicians: Post-Corona Consideration. Evidence Based Care. 2024;13(4):18-27.

9. Fasbinder A, Shidler K, Caboral-Stevens M, editors. A concept analysis: Emotional regulation of nurses. In Nursing forum 2020: 55 (2): 118-27.

10. Lautizi M, Laschinger HK, Ravazzolo S. Workplace empowerment, job satisfaction and job stress among Italian mental health nurses: an exploratory study. Journal of nursing management. 2009;17(4):446-52.

11. Greinacher A, Nikendei A, Kottke R, Wiesbeck J, Herzog W, Nikendei C. Secondary traumatization, psychological stress, and resilience in psychosocial emergency care personnel. International journal of environmental research and public health. 2019;16(17): 3213. doi: 10.3390/ijerph16173213

12. Bentley MA, Crawford JM, Wilkins J, Fernandez AR, Studnek JR. An assessment of depression, anxiety, and stress among nationally certified EMS professionals. Prehospital Emergency Care. 2013;17(3):330-8.

13. Rasouli Ghahfarokhi SM, Pourvakhshoori N, Beyramijam M, Majidi N, Shahabi Rabori MA. Comparing the effects of two different educational methods on clinical skills of emergency intermediate technician: A quasi-experimental research. Journal of education and health promotion. 2019;8(1):54. doi: 10.4103/jehp.jehp_323_18.

14. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA network open. 2020;3(3):e203976. doi: 10.1001/jamanetworkopen.2020.3976.

15. McNeely E. The consequences of job stress for nurses' health: time for a check-up. Nursing outlook. 2005;53(6):291-9.

16. Adriaenssens J, De Gucht V, Maes S. Causes and consequences of occupational stress in emergency nurses, a longitudinal study. Journal of nursing management. 2015;23(3):346-58.

17. Grandey A, Foo SC, Groth M, Goodwin RE. Free to be you and me: a climate of authenticity alleviates burnout from emotional labor. Journal of occupational health psychology. 2012;17(1):1-14.

18. Bamonti P, Conti E, Cavanagh C, Gerolimatos L, Gregg J, Goulet C, et al. Coping, cognitive emotion regulation, and burnout in long-term care nursing staff: a preliminary study. Journal of Applied Gerontology. 2019;38(1):92-111.

19. Soltanizadeh M, Montazeri M, Latifi Z. The Effectiveness Of Cognitive-Behavioral Therapy On Emotional Regulation In Children With Type 1 Diabetes. Iranian Journal of Diabetes and Metabolism. 2019;18(2):97-109.

20. Beaulac J, Sandre D, Mercer D. Impact on mindfulness, emotion regulation, and emotional overeating of a DBT skills training group: a pilot study. Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity. 2019;24(2):373-7.

21. Miller NA, Mc Lean CP, Hope DA. Difficulties with Emotion Regulation Scale (DERS): Confirmatory factor analysis and relationship with several anxiety measures. In 40th annual Conference for the Association of Behavioral and Cognitive Therapy. 2006.

22. Lykins EL. Psychological functioning in a sample of long-term practitioners of mindfulness meditation. Journal of cognitive Psychotherapy. 2009;23(3):226-41.

23. Wylde CM, Mahrer NE, Meyer RM, Gold JI. Mindfulness for novice pediatric nurses: smartphone application versus traditional intervention. Journal of pediatric nursing. 2017;36:205-12.

24. Duarte J, Pinto-Gouveia J. Mindfulness, self-compassion and psychological inflexibility mediate the effects of a mindfulness-based intervention in a sample of oncology nurses. Journal of Contextual Behavioral Science. 2017;6(2):125-33.

25. dos Santos TM, Kozasa EH, Carmagnani IS, Tanaka LH, Lacerda SS, Nogueira-Martins LA. Positive effects of a stress reduction program based on mindfulness meditation in Brazilian nursing professionals: Qualitative and quantitative evaluation. Explore. 2016;12(2):90-9.

26. Azizi A, Mirzaei A, Shams J. Correlation between distress tolerance and emotional regulation with students smoking dependence.Hakim Journal. 2010;13(1):11-18.

27. Ducar DM, Penberthy JK, Schorling JB, Leavell VA, Calland JF. Mindfulness for healthcare providers fosters professional quality of life and mindful attention among emergency medical technicians. Explore. 2020;16(1):61-8.

28. Saberinia A, Aflatoniyan E, Jannat F, Aminizadeh M. The Effect of Mindfulness-Based Cognitive Therapy on Anxiety of Pre-Hospital Emergency Staff. Archives of Rehabilitation. 2019;20(4):340-9.

29. Ando M, Natsume T, Kukihara H, Shibata H, Ito S. Efficacy of mindfulness-based meditation

therapy on the sense of coherence and mental health of nurses. Health. 2011;3(2):118-22.

30. Mackenzie CS, Poulin PA, Seidman-Carlson R. A brief mindfulness-based stress reduction intervention for nurses and nurse aides. Applied nursing research. 2006;19(2):105-9.

31. Goldberg DP, Hillier VF. A scaled version of the General Health Questionnaire. Psychological medicine. 1979;9(1):139-45.

32. Omidi A TA, Sazvar SA, Akashe G. Prevalence of mental disorders in urban areas of the city of Natanz, Isfahan. Andishe-va-raftar Journal of Psychological Education Sciences. 2004;8(4):32-8.

33. Adler AB, Saboe KN, Anderson J, Sipos ML, Thomas JL. Behavioral health leadership: new directions in occupational mental health. Current Psychiatry Reports. 2014;16(10):1-7.

34. Gratz KL, Roemer L. Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. Journal of psychopathology and behavioral assessment. 2004;26:41-54.

35. Lu R, Xiong H, Xia H, Zhou E, Dai X, Chen X. Effects of mindfulness-based stress reduction on negative emotions and sleep quality levels of clinical medical staff members. International Journal Of Clinical And Experimental Medicine. 2019;12(10):12277-81.

36. Duchemin A-M, Steinberg BA, Marks DR, Vanover K, Klatt M. A small randomized pilot study of a workplace mindfulness-based intervention for surgical intensive care unit personnel: effects on salivary α-amylase levels. Journal of occupational and environmental medicine. 2015;57(4):393-9.

37. Chiodelli R, Mello LT, Jesus SN. Effects of a brief mindfulness-based intervention on emotional regulation and levels of mindfulness in senior students. Psicologia: Reflexão e Crítica. 2018;31:21. doi: 10.1186/s41155-018-0099-7

38. Zhang Q, Zhao H, Zheng Y. Effectiveness of mindfulness-based stress reduction (MBSR) on symptom variables and health-related quality of life in breast cancer patients—a systematic review and meta-analysis. Supportive Care in Cancer. 2019;27(3):771-81.

39. Schroeder DA, Stephens E, Colgan D, Hunsinger M, Rubin D, Christopher MS. A brief mindfulness-based intervention for primary care physicians: a pilot randomized controlled trial. American Journal of Lifestyle Medicine. 2018;12(1):83-91.

40. Fortney L, Luchterhand C, Zakletskaia L, Zgierska A, Rakel D. Abbreviated mindfulness intervention for job satisfaction, quality of life, and compassion in primary care clinicians: a pilot study. The Annals of Family Medicine. 2013;11(5):412-20.