

# The effect of training on the promotion of emotional intelligence and its indirect role in reducing job stress in the emergency department

Reza Azizkhani<sup>1</sup>, Asieh Maghami-Mehr<sup>2</sup>, Mehdi Nasr Isfahani<sup>1\*</sup>

1. Department of Emergency Medicine, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran.

2. Department of Statistics, Yazd University, Yazd, Iran.

\*Corresponding author: Mehdi Nasr Isfahani; Email: [m\\_nasr54@med.mui.ac.ir](mailto:m_nasr54@med.mui.ac.ir)

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**Abstract:** **Objective:** The present study aimed at evaluating the role of training in improving emotional intelligence (EI) skills and assessing its indirect effect on reducing job stress in emergency medicine residents (EMRs).

**Methods:** In the present study, 20 EMRs were trained for EI skills while 22 EMRs received no training. Then, all participants' EI level and job stress were assessed and compared before and after the intervention using the Bar-On Emotional Quotient Inventory (EQ-I) and the Osipow job stress questionnaire, respectively.

**Results:** The results of the present study revealed that the EI level in the training group with a mean score of  $338.27 \pm 27.57$  was significantly higher than the control group with a mean score of  $320.50 \pm 28.50$  after training intervention ( $P=0.043$ ). In addition, job stress in the training group with a mean score of  $170.82 \pm 16.11$  was significantly lower than the control group with a mean score of  $183.30 \pm 22.21$  ( $P=0.045$ ). Moreover, in the training group, the relationship between EI and job stress was inverse and significant ( $r=-0.746$ ,  $P<0.001$ ), but in the control group it was non-significant ( $r=0.017$ ,  $P=0.938$ ).

**Conclusion:** According to the results of the present study, training for EI skills can play a significant role in improving EI and reducing stress in EMRs.

**Keywords:** Education; Emergency Medicine; Emotional Intelligence; Occupational Stress

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## 1. Introduction

Emotional Intelligence (EI) is one of the new management skills, especially in the field of human resource management and has significantly attracted public attention over the past decade (1). Although there is much debate about whether EI is acquired or inherent, it is assumed to be a fluid concept that is prone to improvement or deterioration. EI is a distinct concept from Intelligence Quotient (IQ); however, the mentioned two concepts have a complex relationship with each other in the process of decision making (2-4). According to Mayer et al., EI is defined as a set of abilities that facilitate the perception, expression, absorption, understanding, and regulation of emotion and stimulates intellectual and emotional growth (1). In fact, EI consists of four measurable skills including self-awareness, self-management, social awareness, and relationship management (5).

In this regard, previous studies have revealed that EI predicts the scales of life and work satisfaction. A high level of EI is associated with higher levels of life satisfaction and lower levels of anxiety, stress, and work burn out. Regarding that, EI may be associated with job stress and it can also affect a person's job performance in the organization, it seems that EI can indirectly influence the organizational productivity (6-8).

In addition, job stress is one of the main factors in reducing organizational productivity and causing physical and psychological complications in employees, among whom the medical staff are more affected by various stressors due to their responsibility to be sure of the patients' health and treatment. In the meantime, emergency staff is faced with stressful environments such as places crowded with injured and sick patients, etc. The mentioned sites are very challenging and stressful to work. Furthermore, problems such as long working hours are considered as stressful physical and mental stimuli in the emergency departments (EDs) (9-11). Hence, stress management among medical staff is significant because their physical and mental health is associated with the quality of their performance in patients' care and consequently with their satisfaction. In this regard, interventions such as trainings for stress management, changing the workload, increasing the variety of work tasks, providing counseling, and improving communication skills effectively improve EI in the workplace without investing too much time and resources (12-15). However, some studies have revealed that a decrease in physicians' EI is happened due to the lack of attention to medical trainings in this respect and the formal physician-patient relationship (a completely therapeutic relationship) (6,11,16,17). Some studies have also suggested

the impact or association of EI with job stress. Moreover, it is mentioned that the level of employees' job stress can be reduced by training individuals; however, it has not received much attention in the field of medicine. In addition, very limited studies have addressed the indirect effects of EI training on job stress (18-20). Therefore, considering the role of EI in better communication with patients and increasing patients' satisfaction and higher medical staffs' job satisfaction as well as the role of training in this field, the present study evaluated the effect of the training intervention on EI level changes of emergency medicine residents (EMRs) at first and then assessed its indirect effect on their job stress.

## 2. Methods

### 2.1. Study design and participants

This randomized clinical trial (RCT) was done on all the EMRs working in the emergency department of Al-Zahra Hospital, Isfahan, Iran, during 2018-2019. Considering the mentioned point, the population consisted of 48 EMRs. Inclusion criteria were post graduate year-1 (PGY-1), PGY-2, and PGY-3 EMRs that were pleased to participate in the study. They were excluded from the study if they refused to collaborate in this study or did not participate in all sessions completely. This study was performed after receiving ethics committee of Isfahan University of Medical Sciences approval (IR.MUI.REC.1396.2.119), getting clinical trial registration code (NCT05014633) and obtaining written consent from the participants.

### 2.2. Randomization

The participants were divided into two groups of intervention and control using the random allocation software. The created numbers were randomly divided into two groups. Then, each number was written on a piece of paper and put in an envelope, which was subsequently chosen by one participant and they were assigned to the intervention or control group according to the selected envelope.

### 2.3. Data gathering

At the beginning of the study, demographic information including sex, age, post-graduate years (PGY), and marital status were recorded. Thereafter, two questionnaires of Bar-on emotional quotient inventory (EQ-I) and Osipow job stress questionnaires were filled out before training.

#### 2.3.1. Bar-on emotional quotient inventory questionnaire

The EQ-I was first developed by Bar-On in 1980 and consists of 90 items, each of which is answered based on a 5-point Likert scale from 5: strongly agree to 1: strongly disagree. Fifteen scales evaluate emotional self-awareness, assertiveness, independence, self-regard, self-actualization, empathy, social responsibility, interpersonal relationships, reality testing, flexibility, problem solving, stress tolerance, impulse control, optimism, and happiness. The total score is the sum of all questions scores. Higher score is indicative of higher emo-

tional intelligence (21). The results of Cronbach's alpha in one study indicated a reliability of 69-86% (22) for this questionnaire. Cronbach's alpha was also calculated for this inventory in the present study, and the reliability value of 83% was obtained.

#### 2.3.2. Osipow job stress questionnaire

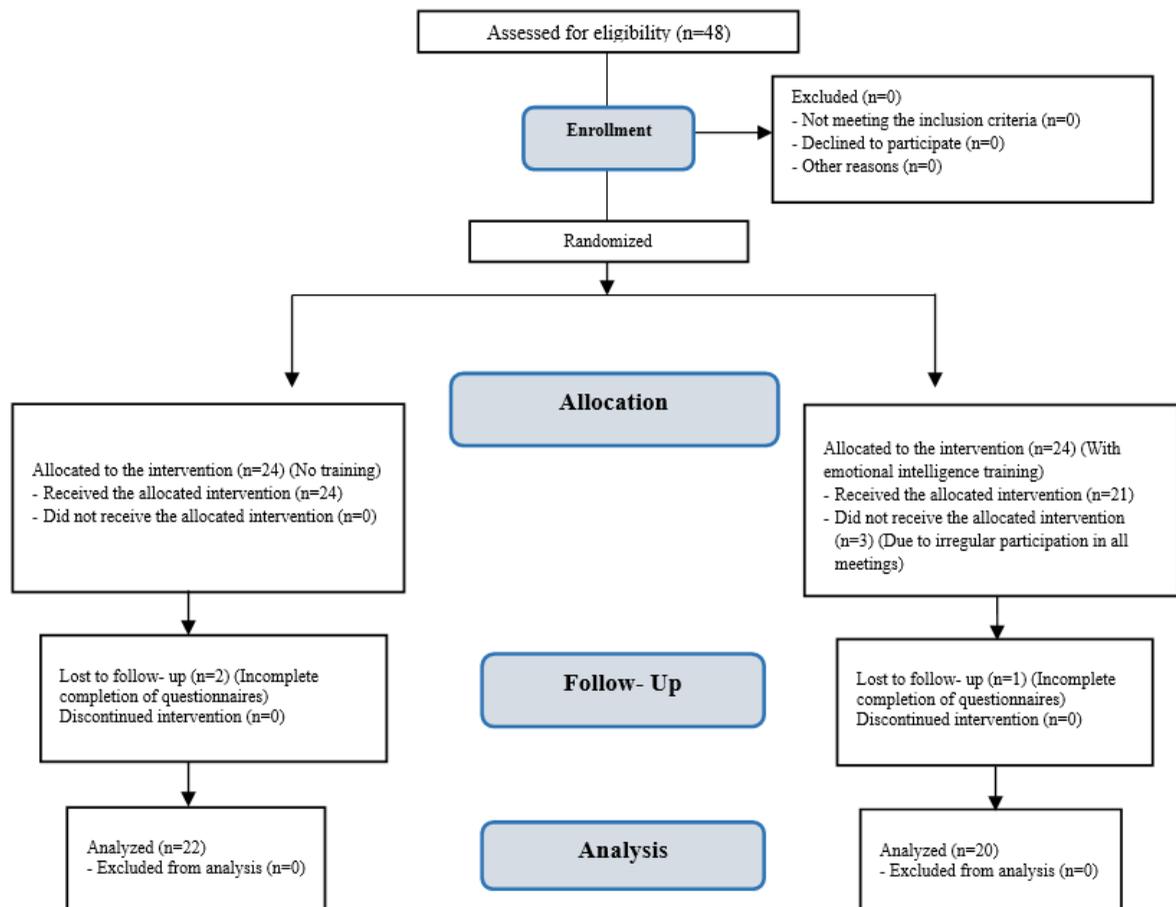
This questionnaire was first developed by Osipow and Spokane in 1987 and consists of 60 items, each of which is answered based on a 5-point Likert scale from 4: most of the time to 0: never. These questions assess six scales including role overload, role insufficiency, role ambiguity, role boundary, role responsibility, and physical environment (23). Based on previous studies conducted in Iran, the Cronbach's alpha coefficient for this questionnaire has been reported to be more than 80% (24,25).

### 2.4. Interventions

Individuals in the control group did not receive any training while the intervention group received training. The duration of training for the intervention group was 16 hours (four sessions of four-hours). The whole training process lasted for one month. EI training sessions were held and managed by two experienced instructors selected from medical education specialists with sufficient experience in conducting EI training. Both instructors attended the sessions, presented the content, videos, slides, and brochures with the help of each other, and managed related scenarios in each session. It should be noted that the instructors as well as the participants had no information about the initial scores of EI and job stress recorded before the training intervention. At the beginning of the first session, the basic definitions and concepts of EI were discussed, and the common environmental stressors were described from the perspective of EMRs. Moreover, a succinct description of the benefits of EI training and practice was provided. After the initial introduction, a number of EI skills were taught in each session by presenting videos and slides and providing brochures. Then, participants were involved in discussions by presenting scenarios related to EI skills in the concluding hours of each session to offer more content load. These scenarios recounted the situation of an individual facing a problem and encompassed a list of suggested reactions including the reasons behind each reaction that an observer was supposed to indicate. Scenarios were generally implemented in smaller groups in such a way that were distributed and discussed among all participants. The assistants were questioned about identifying the source and the cause of concern, potential environmental factors, and how a personal perspective affects their response to the situation. Other scenarios were distributed among the smaller groups and discussed by each groups' representative. Each group presented their analysis and argumentation of the scenario, and then the relevant questions were answered by providing the reasons. The sessions ended by the instructor summarizing different opinions on each of the scenarios (18). Moreover, considering the possibility of the interference

**Table 1** Basic characteristics of the participants in the two groups

Characteristics	Training group (n=20)	Control group (n=22)	P-value
	Number (%)		
<b>Sex</b>			
Female	9(45.0)	10(45.5)	0.976
Male	11(55.0)	12(54.5)	
<b>Post-graduate years (PGY)</b>			
PGY-1	7(35.0)	9(40.9)	0.850
PGY-2	8(40.0)	9(40.9)	
PGY-3	5(25.0)	4(18.2)	
<b>Marital status</b>			
Single	8(40.0)	7(31.8)	0.580
Married	12(60.0)	15(68.2)	

**Figure 1** Consort flowchart of the participants

of EMRs' work shifts, it was planned in coordination with the deputy minister of education that the EMRs would not have any work shifts and would not even be on duty over the four days of training.

### 2.5. Outcome

At the end of the last training session, two questionnaires of EQ-I and Osipow were filled out by the participants of the intervention group. In addition, the participants of the control

group were contacted and asked to fill out these two questionnaires personally (on the last day of the training session related to the intervention group). If the participant in the control group did not meet the conditions for face-to-face encounter, the questions were read to them on the phone and their choice was recorded.

**Table 2** Specification and comparison of the mean of EI and its scales between two groups before and after the intervention

Emotional intelligent scales	Time	Training group	Control group	P-value <sup>1</sup>
		Mean±SD		
<b>Problem solving</b>	Before intervention	23.54±3.16	22.63±3.38	0.373
	After intervention	24.36±3.44	21.75±3.26	0.016
	Difference	0.82±0.33	-0.88±0.14	<0.001
P-value <sup>2</sup>		0.306	0.390	
<b>Happiness</b>	Before intervention	23.50±4.53	22.00±4.14	0.269
	After intervention	25.45±3.80	21.75±3.21	0.011
	Difference	1.95±0.83	0.25±0.20	<0.001
P-value <sup>2</sup>		0.118	0.281	
<b>Independence</b>	Before intervention	22.64±3.37	22.11±2.86	0.585
	After intervention	23.41±2.02	21.10±3.77	0.035
	Difference	0.77±0.45	-1.01±0.98	<0.001
P-value <sup>2</sup>		0.203	0.331	
<b>Stress tolerance</b>	Before intervention	19.05±4.02	19.25±3.35	0.862
	After intervention	20.82±3.25	19.50±2.87	0.173
	Difference	1.77±0.78	0.25±0.11	0.002
P-value <sup>2</sup>		0.078	0.790	
<b>Self-actualization</b>	Before intervention	23.81±3.55	23.20±3.69	0.588
	After intervention	24.27±2.98	23.15±3.08	0.237
	Difference	0.46±0.28	-0.05±0.36	<0.001
P-value <sup>2</sup>		0.578	0.960	
<b>Emotional self-awareness</b>	Before intervention	23.45±3.25	23.00±4.01	0.692
	After intervention	23.55±2.59	21.50±3.15	0.058
	Difference	0.10±0.04	-1.5±0.41	<0.001
P-value <sup>2</sup>		0.871	0.183	
<b>Reality testing</b>	Before intervention	21.95±2.93	22.86±4.21	0.421
	After intervention	22.05±3.10	20.27±2.11	0.035
	Difference	0.10±0.06	-2.59±0.99	<0.001
P-value <sup>2</sup>		0.011	0.481	
<b>Interpersonal relationships</b>	Before intervention	23.55±2.84	23.76±2.89	0.813
	After intervention	24.77±2.91	23.50±3.14	0.961
	Difference	1.22±0.98	0.26±0.12	<0.001
P-value <sup>2</sup>		0.069	0.781	
<b>Optimism</b>	Before intervention	23.04±3.03	23.37±3.51	0.746
	After intervention	23.08±3.46	23.45±2.48	0.370
	Difference	0.04±0.01	0.08±0.03	0.010
P-value <sup>2</sup>		0.955	0.200	
<b>Self-regard</b>	Before intervention	22.00±4.68	22.99±6.32	0.567
	After intervention	23.45±3.39	21.85±3.22	0.124
	Difference	1.45±0.68	-1.14±0.86	<0.001
P-value <sup>2</sup>		0.138	0.248	
<b>Impulse control</b>	Before intervention	20.23±4.44	20.36±3.98	0.921
	After intervention	22.99±3.40	18.20±3.87	<0.001
	Difference	2.76±1.08	-2.16±1.35	<0.001
P-value <sup>2</sup>		0.029	0.081	
<b>Flexibility</b>	Before intervention	20.09±4.23	21.42±4.24	0.315
	After intervention	20.68±3.67	19.35±2.91	0.203
	Difference	0.59±0.28	-2.07±0.98	<0.001
P-value <sup>2</sup>		0.588	0.071	
<b>Social responsibility</b>	Before intervention	26.86±1.91	26.03±3.61	0.357
	After intervention	26.88±2.79	26.00±3.92	0.024
	Difference	0.02±0.01	0.03±0.05	0.385
P-value <sup>2</sup>		0.946	0.156	
<b>Empathy</b>	Before intervention	24.68±3.18	24.03±3.69	0.544
	After intervention	24.09±3.02	23.80±4.15	0.253
	Difference	0.59±0.02	0.23±0.38	0.001
P-value <sup>2</sup>		0.277	0.316	

**Table 2** Specification and comparison of the mean of EI and its scales between two groups before and after the intervention

Emotional intelligent scales	Time	Training group	Control group	P-value <sup>1</sup>
		Mean±SD		
<b>Assertiveness</b>	Before intervention	18.18±4.32	18.36±3.64	0.885
	After intervention	18.45±1.68	18.50±2.35	0.943
	Difference	0.27±0.09	0.14±0.26	0.041
P-value <sup>2</sup>		0.790	0.804	
<b>Total score</b>	Before intervention	337.82±34.24	323.47±31.68	0.166
	After intervention	338.27±27.57	320.50±28.50	0.043
	Difference	0.45±0.38	-2.97±1.03	<0.001
P-value <sup>2</sup>		0.938	0.751	

1: Used of independent samples t-test while comparing the mean of the variable between the two groups;

2: Used of paired t-test for comparing the mean of the variable before and after the intervention in each of the two groups

**Table 3** Specification and comparison of the mean of job stress and its scales between the two study groups before and after the intervention

Job stress scales	Time	Training group	Control group	P-value <sup>1</sup>
		mean±SD		
<b>Role overload</b>	Before intervention	32.41±5.08	30.01±8.63	0.278
	After intervention	31.32±5.02	31.70±6.81	0.836
	Difference	-1.09±0.99	1.69±1.23	<0.001
P-value <sup>2</sup>		0.314	0.348	
<b>Role insufficiency</b>	Before intervention	31.36±4.94	31.11±5.01	0.871
	After intervention	31.00±4.83	32.25±4.76	0.404
	Difference	-0.36±0.27	1.14±1.00	<0.001
P-value <sup>2</sup>		0.752	0.451	
<b>Role ambiguity</b>	Before intervention	32.18±4.43	31.20±4.68	0.489
	After intervention	31.14±2.71	32.45±2.70	0.339
	Difference	-1.04±1.00	1.25±0.63	<0.001
P-value <sup>2</sup>		0.224	0.269	
<b>Role boundary</b>	Before intervention	29.18±4.58	29.86±2.83	0.566
	After intervention	28.73±2.43	31.70±1.34	<0.001
	Difference	-0.45±0.97	1.84±0.68	0.001
P-value <sup>2</sup>		0.697	0.021	
<b>Role responsibility</b>	Before intervention	30.55±5.44	29.32±5.78	0.482
	After intervention	31.27±4.59	31.75±5.95	0.771
	Difference	-0.72±0.98	2.43±1.78	<0.001
P-value <sup>2</sup>		0.526	0.187	
<b>Physical environment</b>	Before intervention	26.32±7.25	25.46±6.66	0.691
	After intervention	22.36±5.17	30.45±6.86	<0.001
	Difference	-3.96±2.11	4.99±2.77	<0.001
P-value <sup>2</sup>		0.012	0.022	
<b>Total score</b>	Before intervention	182.00±22.99	180.23±12.36	0.757
	After intervention	170.82±16.11	183.30±22.21	0.045
	Difference	-11.18±3.51	3.07±1.36	<0.001
P-value <sup>2</sup>		0.147	0.528	

1: Used of independent samples t-test while comparing the mean of the variable between the two groups;

2: Used of paired t-test for comparing the mean of the variable before and after the intervention in each of the two groups

## 2.6. Statistical analysis

Finally, the collected information was analyzed using SPSS software version 25. Data were presented as mean±standard deviation (SD) or frequency (percentage). At the level of inferential statistics, considering the result of Kolmogorov-Smirnov test indicating the normal distribution of data, tests such as Chi-Square test, independent samples t-test, and paired t-test were used. P-value of less than 0.05 was considered significant in all analyses.

## 3. Results

In this study, two participants in the control group ceased their cooperation, and four participants in the training group were excluded from the study due to their irregular participation (not participating in one or more sessions or leaving the session before the end of the session) in all meetings or incomplete questionnaires. Therefore, this study was performed with 22 participants in the control group and 20 par-

ticipants in the training group (Figure 1).

Table 1 presents the baseline information of the participants. The control group consisted of 22 participants with 10 (45.5%) females and 12 (54.5%) males and the mean age of  $27.91 \pm 1.57$  years. The intervention group included 20 participants with 9 (45%) females and 11 (55%) males and the mean age of  $26.96 \pm 2.07$  years (sex:  $P=0.976$ ; age:  $P=0.104$ ).

At the beginning of the study, the mean of the overall EI score and the mean of each dimension scores did not differ significantly between the two groups ( $P > 0.05$ ). The total EI score in the training group with a mean score of  $338.27 \pm 27.57$  was significantly higher than the control group with a mean score of  $320.50 \pm 28.50$  after training ( $P=0.043$ ).

The mean score of EI and its scales between the two groups before and after the intervention are presented in table 2. Evaluation of each EI scales revealed that although there was a slight increase in EI scales following the training intervention ( $P > 0.05$ ); the mean of reality testing and impulse control significantly increased after EI training compared to before. The means of problem solving, happiness, independence, reality testing, impulse control, and responsibility in the training group were significantly higher than the control group after training. Moreover, the comparing the mean changes of total EI score and each dimension score revealed that problem solving, happiness, independence, stress tolerance, self-actualization, emotional self-awareness, reality testing, interpersonal relationships, optimism, self-regard, impulse control, flexibility, empathy, assertiveness, and total EI were significantly different between the two groups.

The mean score of job stress and its scales between the two study groups before and after the intervention are presented in table 3. The evaluation of job stress and its scales among EMRs indicated that job stress was not significantly different between the two groups before the intervention ( $P > 0.05$ ). However, the job stress score in the training group with a mean score of  $170.82 \pm 16.11$  was significantly lower than the control group with a mean score of  $183.30 \pm 22.21$  after training ( $P=0.045$ ). Following the training intervention, the scales of role boundary and physical environment scales in the control group were significantly higher than training group ( $P < 0.001$ ). Other scales of stress still did not indicate any significant difference between the two groups ( $P > 0.05$ ). Changes of the mean job stress and each of its dimensions including role overload, role insufficiency, role ambiguity, role boundary, role responsibility, and physical environment were found to be significantly different between the two groups.

Finally, the evaluation of the relationship between changes in EI and job stress revealed that the correlation coefficient of these two variables in the training group was  $-0.746$  and significant ( $P < 0.001$ ), and the mentioned value in the control group was  $0.017$  and non-significant ( $P=0.938$ ).

## 4. Discussion

The results of the present study revealed that generally the EI level of EMRs in the training group was significantly higher than the control group. In fact, the results of comparisons between the training and control groups revealed that training could increase the level of all scales in trained group, with the exception of the social responsibility.

In line with the findings of the present study, the results of the study conducted by Erkayiran et al. (2018) also indicated that training with the implementation of materials to improve structured EI skills was effective to improve the interpersonal relationship styles and EI scores of the nursing students. Hence it was concluded that nurses' interpersonal relationship styles and EI skills can be improved by incorporating the mentioned skill training method into the in-service trainings in hospitals and nursing education curriculum (26). The results of another study with respect to training EI skills for students of the third grade medicine department indicated that the post-training EI scores of test group were significantly different from those of the control group (27). The mentioned finding was consistent with the current study.

Although related studies have followed different number and hours of training sessions, all of them have reported the positive effect of these trainings on promotion of EI skills. However, as none of these studies have evaluated the impact of training on various scales of EI, the present study can be regarded as an initiative and more detailed study in this regard. The present study showed that the implemented training can make the medical staff happier, improve their problem-solving ability, increase their reality testing, responsibility, and empower their impulse control that consequently can lead to EI improvement.

In fact, from a practical point of view, it can be stated that EI has a moderating role with regard to stress and is a significant tool in stress coping. Given the learnability feature of EI, various organizations can empower their employees with the essential competences and skills and thus help them to better coping their stress. In addition, employees' work-life balance can be maintained by the integration of EI trainings into systematized stress management programs. Moreover, organizational commitment and job satisfaction can be considered as other benefits of EI training. A combination of stress management and EI trainings can be offered to employees to help them gain the required skills and better tackle with the necessities of their job (7,28).

Furthermore, many studies have examined the relationship between EI and the health of assistant physicians and how it can affect job success including job satisfaction and continuity (12-15).

In addition, the evaluation of job stress and its scales indicated that the stress score of the trained group was lower than the control group after training. These reductions have been evident in scales of role boundary and physical environment. In fact, lower stresses induced by the individual's role and responsibilities as well as the environmental stress, the over-

all stress of this treatment staff has also been significantly reduced.

In this regard, Bahrami et al. (25) revealed that role ambiguity, responsibility, and workload are the most important factors in nurses' job stress. Another study confirmed the relationship between EI and job stress and mentioned that promoting EI through training courses that may reduce or prevent job stress of rehabilitation staffs (29).

In fact, in our study, EI training could indirectly reduce the job stress of EMRs. The correlation coefficient of these two variables was strong and inverse. In other words, the results of this study showed that there is a significant reduction in job stress of trained personnel by increasing EI.

In line with this result, the findings of many previous studies have revealed that EMRs with low EI were not able to cope with the stress induced by courses and practice and also tended to quit their jobs. However, higher social behavior, better academic performance, better communication with patients, and more job continuity were reported by EMRs with higher EI (13,14). Although these studies have not addressed the effect of training in this regard, their results indicated a significant relationship between the two variables. Therefore, some other studies have introduced various training strategies ranging from simple to introduce non-verbal cues of emotions to more advanced trainings for self-reflection and introduction of very effective situational stressors to EI improvement (5,11,17).

Rakhshani et al. (2018) in their study stated that there was a strong and inverse relationship between nurses' EI and job stress and suggested to include EI training workshops within in-service training programs for nurses (6).

Other studies have revealed that not only EI training promotes EI, but also significant increases in social skill and empathy (29) or self-control, cooperation, and self-awareness (30) among EI scales have led to lower job stress. It should be noted that variation or differences in the results can be due to the use of different questionnaires to assess EI and job stress; however, what matters is that all the mentioned studies have pointed to the existence of a relationship between EI and stress and have confirmed the role of training in the improvement of EI and its indirect effect on reducing job stress in employees.

## 5. Limitations

It can be stated that although the use of questionnaires with more scales was one of the strengths of the present study, there were some limitations, as well. The small size of the sample and the limited number of training sessions, which lasted 16 hours, were some of the limitations of this study. The mentioned limitations were unavoidable due to the implementation of this study among the medical staff and the difficulty in holding training sessions due to the work shifts of these employees. However, considering the positive results obtained in this regard, it is suggested to conduct future studies to generalize the findings to the target population. Imple-

mentation of similar studies is of great significance as training and improving the quality of emotions of these employees due to their communication with the patient can affect their stress control, satisfaction, and job performance, which in turn will be associated with more patient satisfaction with medical care.

## 6. Conclusion

According to the results of the present study, the mean score of EI as well as all its dimensions, with the exception of social responsibility, was significantly higher in the training group compared with the control group, following the training. EI training also indirectly reduced the job stress. In addition, a significant inverse relationship was observed between EI and job stress in these employees.

## 7. Declarations

### 7.1. Acknowledgment

We would like to show our gratitude to the emergency medicine residents and all the participants who co-operated with us in this study.

### 7.2. Authors' contribution

The conception and design of the work by M.NI; data acquisition by R.A; analysis and interpretation of data by A.MM; drafting the work by M.NI; revising it critically for important intellectual content by M.NI and R.A; all the authors approved the final version to be published; and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work.

### 7.3. Conflict of interest

The authors declare they have no conflict of interest.

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