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## A study of emotional intelligence and the effect of educational intervention in emergency medicine residents

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### Summary

**Introduction:** This study aimed to examine emotional intelligence components and the impact of education in residents on emergency medicine wards.

**Materials and Methods:** The study consists of two descriptive and interventional parts. The first part aimed to determine the IQ in emergency department residents and the second part – the effect of education on emotional intelligence of residents. To collect the required information, Sheering Emotional Intelligence Inventory was used. SPSS version 16 was used for data analysis.

**Results:** Among the components of emotional intelligence in 120 residents of emergency medicine, the highest mean score was that for self-awareness (mean and standard deviation at  $24.8 \pm 3.7$ ), and the lowest score was for social skill (mean  $16.2$ , SD  $\pm 3.4$ ). There was no significant difference between the components of emotional intelligence in the intervention group and the control group before an educational intervention ( $P = 0.05$ ), but after the intervention the difference between the groups became significant ( $P \leq 0.05$ ).

**Discussion:** The descriptive findings of this study showed that among the emotional intelligence components, self-awareness and social skills of the residents had the highest and the lowest mean scores, respectively.

**Conclusion:** This study showed that teaching emotional intelligence to emergency medicine residents had a significant role in increasing their emotional intelligence.

**educational intervention, emotional intelligence, emergency medicine residents**

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### INTRODUCTION

Emotional intelligence is a set of abilities, competences and non-cognitive skills affecting an individual's ability to succeed in coping with environmental demands and pressures [1]. As a more comprehensive definition, emotional intelligence refers to a complicated structure including perception, processing, regulations and management of feelings [2].

Before the introduction of the concept of emotional intelligence, all eyes were turned towards cognitive intelligence and it was considered as the most effective factor in individuals' success. Today, however, a majority of experts believe that cognitive intelligence at best contributes only 20% to a person's success and 80% of success depends on other factors. Perhaps the fate of people in many cases depends on their emotional intelligence skills [1,3]. According to Goleman's emotional intelligence model, the basic components of emotional intelligence have two subscales of individual and social capabilities. Self-awareness, self-regulation and motivation are aspects of the individual subscale, and the social capability scale includes empathy and social skills. Our ability to learn working skills depends on these basic components of emotional intelligence [4,5].

An emergency ward is one of the most important parts of a hospital [6]. It works as the heart of the hospital [7] whose performance can have a significant impact on other sections of the hospital, on patient satisfaction and on saving people's lives [8]. However, it faces serious problems, such as shortage of beds and patient overcrowding [9]. On the other hand, despite the high volume of patients, stay in emergency ward is very short. Hence, it follows that there is limited communication between patients and service providers on the emergency ward and this makes service providers face many problems, such as incomplete information about the patient's history and dealing with large numbers of patients in a short time. Thus, having capable human resources in this section of the hospital is vital [6].

The most important goal of any organization, including hospital emergency wards, is to attain the highest level of productivity, and one of the factors affecting it is having an efficient workforce [10]. For doctors who work in an emergency department, their emotional intelligence model changes over time [11], and many studies have shown that it can also progress [12,13]. Emotional intelligence is a predictor of success in the performance of residents [14]. Residents with low emotional intelligence cannot cope well with stress in their work environment unless they have trained and practiced to do so [15]. Conversely, residents with higher emotion-

al intelligence can deal with stress better and have better social relationships [14]. According to the four categories of emotional intelligence referred to earlier, and bearing in mind the importance of this issue for residents on emergency wards, the important point is whether emotional intelligence is innate or whether it can be learnt [16-18].

Educational strategies for improving emotional intelligence of individuals are very different. They range from simple tutorials for identifying feelings to advanced training for recognizing and reflecting on job stressors in work environments [19]. Educational interventions at work include education about job burnout, changes in workload, increasing the variety of job tasks, stress management training, consulting, communication skills and health [20]. The success of emotional intelligence educational programs in all medical groups can be useful in medical education courses [21].

In general, due to high volume of work and a lack of variety in their job, emergency personnel tend to develop job burnout very quickly and this lowers their performance as well as the performance of the emergency department. On the other hand, none of the aspects of health care is as important as the ability of emergency department in the assessment, treatment and judging a patient's state within a specified and acceptable time frame. Given the importance of emotional intelligence in the management of patients and in controlling emotions and feelings in dealing with patients, and due to the fact that emotional intelligence can be improved through educational intervention, this study was conducted to examine the emotional intelligence of residents in emergency medicine. The residents' scores on emotional intelligence components were used to develop an educational program based on emotional intelligence components that needed improvement.

## MATERIALS AND METHODS

### Study design

The study consisted of two descriptive and interventional parts and was conducted to determine the effectiveness of an emotional intelli-

gence intervention on emergency medicine residents. The first part of the study assessed the level of emotional intelligence in the residents and the second part investigated the effect of an education intervention on emotional intelligence of the residents.

### Study population

The study population consisted of first – to third-year emergency medicine residents who gave their consent to participate in the study and who took part in interventional emotional intelligence sessions. Students who were reluctant to attend the sessions were excluded from the study.

### Sample size

To select the samples, after examining the desired conditions and talking with residents who were willing to participate in the study, 120 emergency medicine residents were randomly selected from several medical schools. To do the intervention, 67 residents from the first sample size were randomly divided into two groups: case (N = 33) and control (N = 35). Finally, they were reduced to 30 individuals in each group who carried out the post-test [22].

### Data collection tool

A demographic information checklist and Sheering Emotional Intelligence Inventory were used. The checklist included socio-demographic characteristics such as age, gender, work experience and the year in medial education. The standard Emotional Intelligence Inventory (Siberia or Sheering) contains 33 questions in 5 dimensions: the individual capability subscale included self-awareness, self-control and motivation dimensions, and the social capability subscale included empathy and social skill dimensions. The questionnaire was presented as a 5-point Likert scale as follows: 1 – never, 2 – rarely, 3 – sometimes, 4 – often, 5 – always. It has been designed and scored reversely for negative questions.

### Validity and reliability of the questionnaire

The validity and reliability of the questionnaire had already been measured in various studies; in a study to determine its validity, it was given to 10 experts and its validity was measured 0.85%. In terms of the reliability of the questionnaire, its Cronbach's alpha was reported at 0.84% [23, 24].

### Educational intervention

After performing a cross-sectional descriptive study and statistical analysis, the state of emotional intelligence and its sub-components was identified, and served as a basis on which an educational program was developed and implemented in order to improve it. The program was structured in four sessions and implemented every other week over 2 months for case group residents. In addition to educational sessions, educational aid tools such as pamphlets were also used to enhance the knowledge and skills in the intended field. Two months later, the emotional intelligence questionnaire was completed again by 30 residents in the intervention group and those in the control group. It should be noted that an informed consent was obtained from all participants in this study. In addition, the names of participants and their universities remained confidential.

### Statistical analysis

The collected data were analyzed using descriptive indices of mean, standard deviation and ANOVA, independent t-test, Pearson correlation coefficient, and chi-square statistical test to investigate the relationship between the variables. SPSS version 16 was also used for analysis. The significance level in all tests was considered  $P = 0.05$ .

## RESULTS

120 residents with the mean age of 34.07 years ( $SD \pm 7.2$ ) participated in the study. Among them, 49 (40.2%) were female and 62 were male (50.8%); 11 (9%) did not disclose their gender.

68 participants (55.7%) were married, 38 (31.1%) were single, and 16 (12.3%) did not reveal their marital status. In terms of years in specialist resident education, 44 participants (36.1%) were in their first year, 32 (26.2%) were in their second year, 27 (22.1%) were in their third year, and 19 (14.9%) did not comment.

Among the components of emotional intelligence, the highest score was that of self-awareness ( $M=24.8$ ,  $SD \pm 3.7$ ), and the lowest – social skill ( $M=16.2$ ,  $SD \pm 3.4$ ). These results are shown in detail in Table 1.

**Table 1.** Emotional intelligence components in residents participating in the study

Component	Mean, SD	Maximum score obtained	Median	Minimum score obtained
Motivation	22.09±4.07	35	23	7
Self-awareness	24.8±3.7	40	25	8
Self-control	22±5.3	35	22	7
Empathy	19.6±3.4	30	20	6
Social skills	16.2±3.4	25	16	5
Emotional intelligence	85.8±1.3	165	87	33

The results of the analytical test are shown in Table 2. Pearson correlation coefficient analysis showed that there was no significant relationship between emotional intelligence components and the age of the participating residents. The Chi-square test showed a significant relationship between emotional intelligence components and gender ( $P \leq 0.05$ ), but no significant

relationship was found between general emotional intelligence and gender ( $P \geq 0.05$ ). Furthermore, the results of ANOVA test showed that there was no significant relationship between the components of emotional intelligence and general emotional intelligence and the variable of year of education ( $P \geq 0.05$ ). Table 2.

**Table 2.** Relationship between demographic variables, the components of emotional intelligence and general emotional intelligence in participating residents

Component	Age	Gender	Year of specialist resident education		
	Correlation coefficient	P-value	P-value	F	P-value
Self-motivation	0.1	0.38	0.00	0.72	0.53
Self-awareness	-0.03	0.76	0.00	0.86	0.46
Self-control	-0.08	0.45	0.00	0.85	0.46
Empathy	-0.03	0.79	0.00	2.08	0.1
Social skills	0.002	0.98	0.00	1.02	0.38
Emotional intelligence	-0.02	0.86	0.1	0.8	0.49

Among the components of emotional intelligence, self-control (Beta = 0.87) had the most predictive power and empathy (Beta = 0.61) had the least predictive power in emotional intelligence of the residents. 60 residents remained in

the study at the intervention stage, and the results of their demographic questionnaire are presented in Table 3. Regarding demographic variables, there was no significant difference between the intervention and control groups ( $P \geq 0.05$ ).

**Table 3.** Distribution of demographic variables in intervention and control groups (N = 60)

Variable		Intervention group	Control group	P-value
Age, years: mean, SD		32 ± 6.16	35.22 ± 7.1	0.12
Gender, N (%)	Female	13 (43.3 %)	14 (46.7%)	0.78
	Male	14 (46.7 %)	15 (50%)	
Relationship status, N (%)	Single	17 (56.7%)	15 (50%)	0.22
	Married	10 (33.3%)	13 (43.3%)	
Years of specialist resident education, N (%)	Year 1	9 (30%)	9 (30%)	0.65
	Year 2	8 (26.7%)	10 (33.3%)	
	Year 3	10 (33.3%)	8 (26.7%)	

Among the components of emotional intelligence, the highest mean was that of self-awareness in the intervention group (M=25.73, SD ± 2.7) and in the control group (M=26.7, SD ±2.9), and the lowest mean was that of social skill in the intervention group (M=14, SD ±2.8) and in the control group (M=13.52, SD ±3.3). These re-

sults are shown in detail in Table 4. They indicate that before the educational intervention, there was no significant difference between the components of emotional intelligence in the intervention and control groups (P ≥ 0.05) but after the educational intervention (P ≤ 0.05) the difference became significant.

**Table 4.** Impact of education on emotional intelligence components of residents before and after an educational intervention (N = 60)

Component	Pre-intervention			Post-intervention		
	Intervention group (Mean, SD)	Control group (Mean, SD)	P-value	Intervention group (Mean, SD)	Control group (Mean, SD)	P-value
Motivation	18.24±3.5	17.21± 4.5	0.55	24.17±6.56	17.21± 2.1	0.03
Self-awareness	25.73±2.7	26.7±2.9	0.2	29.82±4.62	27.12±1.4	0.02
Self-control	19±3.7	18.25±2.64	0.12	24.1±7.15	18.25±2.64	0.05
Empathy	17±3.1	18.44±4.12	0.10	20.46±3.2	18.44±4.12	0.00
Social skills	14±2.8	13.52±3.3	0.65	21.63±3.1	13.21±2.1	0.01
Emotional intelligence	94.73±13.2	92.23±11.1	0.34	116±18.84	93.4±9.6	0.00

**DISCUSSION**

The aim of this study was to investigate the effect of education on emotional intelligence of emergency medicine residents. Prior to the educational intervention, the emotional intelligence of the emergency department residents was average, and this is consistent with previous studies [25-26]. Another study that had evaluated the emotional intelligence of medical students in Iran had estimated their level of emotional intelligence as average [27]. Since emotional intelligence is to some extent acquired and influenced by education, this result might be attrib-

uted to factors such as the academic majors selected and the university education students had received, so that different educational and evaluation systems in universities seemed to partly influence the differences in emotional intelligence in various studies.

The descriptive findings of this study showed that among the emotional intelligence components, self-awareness and social skills had the highest and lowest mean scores, respectively, and this is consistent with the findings of Keshavarz et al. [28]. The self-awareness component, which indicates a more effective knowledge of individuals about their abilities and strengths,



can lead to the selection of appropriate learning strategies, monitoring them and arranging time for studying educational materials. The social skills component that plays a role in establishing positive relationships with colleagues and patients as well as having intimate relationships, involves learning skills such as empathy, expression of feelings, showing respect for rationality and individual differences, and is one of the factors that can improve both communication and interpersonal skills. Hence, it may lead to improving the effectiveness of residents' performance in the emergency department [28].

The results of this study showed that there was no significant difference between emotional intelligence and age, gender and years as medical emergency resident. In other words, male and female residents enjoyed the same level of emotional intelligence in dealing with everyday problems and performing in the emergency department. These results are consistent with those by Dini, who established that there was no significant difference between the total scores of emotional intelligence of men and women [29]. In this regard, the study by Besharat et al. showed that the level of emotional intelligence among men and women was not significantly different [30]. In his research, Furnham found that there was no significant difference between emotional intelligence and gender, although he suggested that this relationship required further study [31].

Various studies have shown that emotional intelligence is directly related to health and safety and plays a major role in the emergence of appropriate health behaviors, implementation and attention to treatment [32, 33].

The findings of this study indicated that after an educational intervention, emotional intelligence and its individual components improved in residents in the intervention group. This is consistent with the results achieved by Gorgas et al [34]. This finding suggests that residents in need of emotional intelligence education are doing their job, and findings of previous studies have also shown it [35, 36]. As expected, in the control group the general emotional intelligence and its components were almost unchanged before and after the intervention, and this was consistent with the findings of Gorgas et al. [34].

Therefore, it appears that education and use of the concept and skills of emotional intelligence can be effective in improving the performance of emergency medicine residents and their social intelligence, and the lack of attention to and focus on cognitive intelligence might help improve these skills and promote emotional intelligence in medical residents. Improving and strengthening the concept of emotional intelligence and its related skills are some of the important tasks of the relevant authorities, and teaching these issues is really necessary.

### STUDY STRENGTHS AND LIMITATIONS

The first limitation of the present study was the short time of the educational intervention as well as a small sample size. The second limitation was that the results could not be generalized. However, one of the strengths of the study was its descriptive, cross-sectional design, and a short-time, targeted intervention program for more predictive components and some components of emotional intelligence with the lowest score.

### CONCLUSIONS

The findings of this study showed that education can play an important role in improving the emotional intelligence of emergency medicine residents. Therefore, it is suggested that educational interventional programs consider an improvement of emotional intelligence in the curriculum of residents, especially freshmen. Additionally, emotional intelligence educational courses should be held continuously for hospital staff and medical students at different educational levels. Particularly in emergency medicine departments, self-awareness and self-control as well as decision-making powers and communication skills of residents are necessary for communicating with patients, their relatives and other medical residents, as this will have a significant impact on improving the quality of hospital care. It is suggested that researchers and experts investigate emotional intelligence from an academic perspective and carry out further studies in this field in the health care sector.

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**Conflict of interest**

*None declared.*

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