



Emotional intelligence of medical students of Shiraz University of Medical Sciences cross sectional study



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ABSTRACT

Emotional intelligence is the ability of an individual to assess and control emotions in oneself and others and also use this information in ongoing coping methods. Emotional intelligence is known to have an effect on the success rate of an individual as well as job performance and satisfaction. Though contradictory, emotional intelligence is supposed to have multiple factors affecting it. The aim of this study was to investigate whether Shiraz University of Medical Sciences has an effect on the emotional intelligence of its medical students and also whether the students' emotional intelligence had a relationship with their gender, hometown, and application exam rank or cumulative grade point average. Junior and senior medical students were approached from Autumn (2016) until winter 2017 and asked if they would fill out the Persian translation of TEIQue-SF questionnaire. They were also asked to inform us about their gender, educational region, cumulative grade point average, and Konkoor rank. The data was later analyzed by SPSS ver. 22. A significant difference was found between emotional intelligence of junior and senior medical students. No significant difference was found between emotional intelligence of male and female participants and there was no relation between emotional intelligence and Konkoor rank, cumulative grade point average, and educational region. The results showed that medical education has a negative effect the emotional intelligence. Males and females in this study had the same emotional intelligence that suggests the social effects on emotional intelligence. Also, the net effect of hometown and culture was not significant enough to influence emotional intelligence. As we analyzed the relationship of emotional intelligence and cumulative grade point average, it was concluded that the academic success of the students which is based on their scores is not related to their emotional intelligence.

1. Background

Emotion is any kind of mental experience which has a high gravity that causes mental disturbance and also has a high pleasure content; either pleasant or unpleasant [1]. These experiences themselves are results of deeper processes and so they can influence perception and social communications [2]. Intelligence is the ability of an individual to function purposefully, think wisely and communicate with the surrounding which can be summed into the ability to solve cognitive difficulties and is divided into multiple subgroups e.g. linguistic, logical, visual, etc. [3–5]. Emotional intelligence¹ is an individual's ability to assess, express and control emotions and feelings in him or her and others, differentiate among them and use them into coping methods [3].

EI can be studied into 3 categories:

1. Assessment and expression of emotions:
 - in oneself, which happens in a verbal and a deeper non-verbal level.
 - in others, which happens in a non-verbal and a deeper level named "Empathy" which some say it is the most important aspect of EI.
 2. Balancing of emotions in oneself and others.
 3. Application of emotions into dealing with complex situations [3].
- The EI itself consists of two major domains:
- 1 Trait EI, which is the individual's point of view about himself and his abilities and personalities and is measured through self-report tests.
 - 2 Ability EI, which is the individual's ability to perceive others' emotions and regulate oneself and others' emotions and is measured through maximum-performance tests [6,7].

EI interacts with many aspects of medical practice like diagnostics,

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¹ EI.

relationship with patients, teamwork, communication, empathy, etc. so it can be used to improve clinical and educational aspects of medicine [8]. Also EI is effective in dealing with stressful situations of the medical career in addition to job satisfaction and improving performance [9–13].

According to the studies performed on EI and the factors affecting it, despite their contradictions such as studies of Marzuki et al., Waddar et al., Rauf et al., Imran et al., Mckinley, Naeem et al. and Patel, it can be suggested that factors like age, gender, birth place and living place, financial and educational situation of the family, individual's level of education, university and even living in a home instead of dormitory might have an effect on EI [11,14–21].

Studies of Vandervoort, Bachard and Fitness et al. suggest that EI increases the chance of success due to the improvement of the learning trend in addition to improving personal, interpersonal and social relationships. Also, EI has an effect on career selection but Borges et al. did not find a significant difference in EI of residents of different specialties. Based on its importance, EI should be considered into the curriculum [9,22–24]. Unfortunately, most of the educational centers are focused on nurturing the linguistic and logical aspects of intelligence [5].

Of professional aspect, it is proven that EI is effective in dealing with stressful situations of the medical career in addition to job satisfaction and improving performance. Also, EI is effective in interpersonal skills and patient care [10–13].

The aim of this study is to compare the EI between junior and senior medical students of Shiraz University of Medical Sciences² to see if SUMS has an effect on its medical students and assess students EI's relationship with their gender, Cumulative Grade Point Average,³ application exam rank⁴ and their educational zone.⁵ Given the few number of EI studies in Iran, this is the second study to measures EI with TEIQue-SF⁶ in Iran.

2. Materials and methods

The study took place in Shiraz University of Medical Sciences, Shiraz, Iran from October 2016 until March 2017. The study was approved by Shiraz Medical Sciences University's ethics committee. All junior medical students and senior medical students (medical interns) were approached between classes or in clinics, hospitals or dormitories in this period and asked if they would fill out the questionnaires. They would fill it at the same time or later and then contact us to retrieve them, whichever they preferred. Written informed consents were taken from them for publication. The transferred students were excluded from the study.

In this study, the Persian translation of TIEQue-SF Questionnaire was used as a tool to measure trait EI of the medical students.⁷ The TEIQue-SF is the short form of the TEIQue (also a questionnaire) which both was designed by Petrides & Furnham [6,25–28]. Reliability and validity of the translation were previously tested and approved by Bayani (author) with Cronbach's alpha of 0.82 [29]. TEIQue-SF measures the five scores of trait EI (Total trait EI, Emotionality, Self-control, Sociability, Well-being) [30]. The Persian translation did not confirm the four factor model of English version [29].

The TEIQue-SF is a 30-item self-reporting questionnaire that measures trait EI. Each item can be scored from one, totally disagreeing

with the statement, to seven, totally agreeing with the statement. with the total score ranging from 30 to 210. The estimated time of questionnaire completion is approximately 5 min. The participants were also asked to write whether they were a senior or junior medical student, their CGPA (if applicable), their university application exam rank, their gender, and their educational zone.

In some universities of Iran e.g. SUMS, students are divided into two groups, mostly based on their entry exam rank and enter the schools in two separate semesters. Aim of this study was to see if students' EI is related to their educational status, although because some junior students are in their first semester of medical school and have not received their final exams, their EI was compared to their Konkoor rank. We did not use their high school's CGPA in this study because they came from different schools with different teachers and different evaluation methods, so their CGPA would not be comparable. Due to this difference, EI of students who were in their first semester were compared with their Konkoor rank and the rest of the junior students and senior students' EI were compared with their CGPA.

Statistical analysis was performed using SPSS version 22. Quantitative and qualitative data were described by mean \pm standard deviation and frequency (percent). Shapiro-Wilks test was employed to evaluate normality. Due to denying normality, Nonparametric tests, Mann-Whitney and Kruskal-Wallis, were used to compare quantitative data between the groups. Correlation between the quantitative variables were assessed by Spearman correlation coefficient.

3. Results

A total of 435 students participated in this study from a total 604 junior and senior students. Total response rate was 70%. 271 out of 321 junior medical students and 164 out of 283 senior medical students agreed to participate in this study with the response rates of 84.44% and 57.95% respectively. The total EI of junior and senior medical students was calculated. After being analyzed by Mann-Whitney test it was concluded that the difference of EI between junior and senior medical students was significant ($P = 0.008$) (See Table 1).

All 164 senior medical students determined their gender. 3 out of 271 junior students did not determine their gender so they were excluded (1%). After analyzing the data, it was concluded that there is no significant relationship between gender and EI (See Table 2).

A total of 178 students were in their first semester and 156 students out of them (88%) informed us about their Konkoor rank. With the spearman's coefficient of -0.103 , it was concluded that there is no significant relationship between EI and Konkoor Rank ($P = 0.201$) (See Fig. 1).

All junior students who were in the second semester and 150 out of 164 senior students (91%) informed us about their CGPA. With the Spearman's coefficient of 0.063 for the junior students and -0.029 for the senior students, it was concluded that there is no significant relationship between EI and CGPA ($P = 0.550$ and $P = 0.729$ respectively) (See Figs. 2,3).

From a total of 271 junior students and 164 senior students, 266 junior students (98%) and 163 senior students (99%) informed us about their educational region that they came to SUMS from. After analysis, it was concluded that there was no significant relationship between EI and the educational region of junior and senior students ($P = 0.519$ & $P = 0.695$ respectively) (See Table 3).

4. Discussion

In this study EI of senior medical students were significantly lower than junior medical students so it can be concluded that EI decreases in the course of medical education. It is not clear when this decrease in EI happens and it can be looked into future studies. One of the limitations in this study was that we could not differentiate the effect of university from participants' age on EI that some studies like Naeem et al. and

² SUMS.

³ CGPA.

⁴ Also known as Konkoor in Iran, is a cross-country exam that determines, based on the rank, which university and major each participant can apply to.

⁵ There are 3 educational zones in Iran that show how rich each zone is educationally equipped; Zone 1 being the richest zone and zone 3 being the poorest zone. For example, Shiraz is in the zone number 1.

⁶ Trait Emotional Intelligence Questionnaire-Short Form.

⁷ Available on <http://www.psychometriclab.com/>.

Table 1
Comparison of EI between the junior and senior medical Students.

	Junior students	Senior students	P
Total Score	149.538 ± 23.113	143.274 ± 22.875	0.008

Table 2
Comparison of EI between male and female participants.

	Gender	N	Total Score	P
Junior students	Male	131	150.946 ± 23.376	0.396
	Female	137	148.313 ± 22.355	
Senior students	Male	87	143.436 ± 21.680	0.903
	Female	77	143.090 ± 24.296	

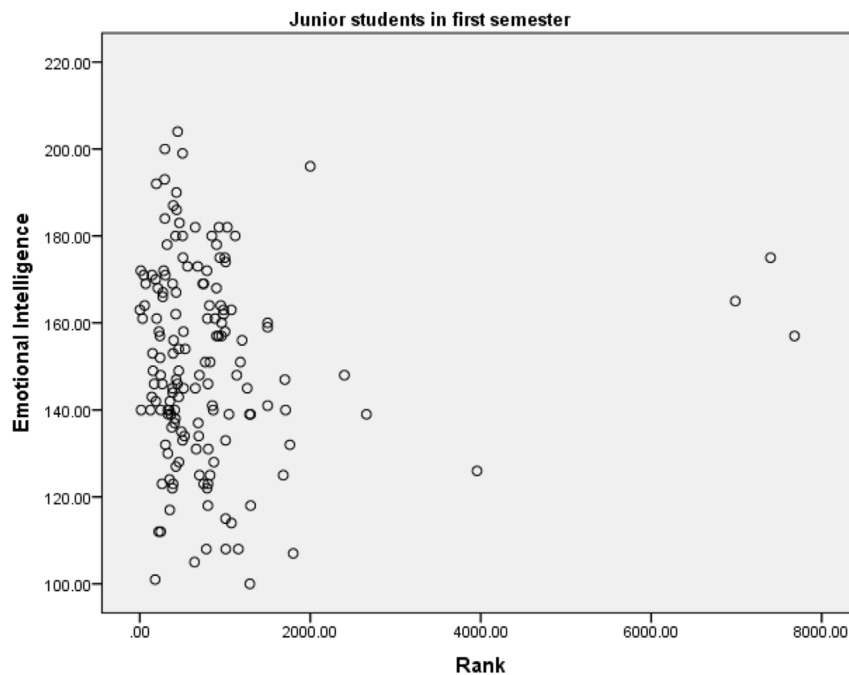


Fig. 1. The EI of junior students based on their Konkoor rank.

McKinley had focused on [11,20].

The relationship between CGPA (or Konkoor Rank) and EI was also studied and it was concluded that there was no significant relationship. This finding was contradictory of what Naeem et al., Chew et al., and Marzuki et al. achieved but confirmed the findings of Mitrofan et al. and Rauf et al. [14,15,20,31,32]. These findings suggest that SUMS's medical students perform totally different on EI and evaluations and there might be no relationship between their EI and their academic success which is based on their CGPA. Marzuki et al. also suggested that the relationship between CGPA and EI is because the students with better grades have higher IQ and that makes them use their EI to their advantage in exams [15].

According to our findings and these studies [15,20,31], it can be concluded that the decrease in EI in the course of medical education may be the result of unavailability of educational programs to increase EI or help students use their EI more properly because if they could use their EI properly, we might have been able to find a relationship between their EI and CGPA. But it does not explain why EI decreases in the course of education and is not relatively equal between junior and senior students. An explanation of this decrease according to findings of Ravikumar et al. is that the senior medical students (which are medical interns) were under pressure of their last night's shifts since Ravikumar found that doctors tend to have lower EI after night shifts [33]. So when

they were filling the questionnaires, their self-reported EI was affected by tiredness of their shifts. Another explanation of decrease in EI of medical students – according to a study of Kerasidou et al., would be that doctors are tend to be “emotionally detached” from their patients because it is considered unprofessional amongst doctors and as a result, this leads to decreasing empathy (which is a part of EI) [34]. This is what Mahood (author) refers to as hidden curriculum [35].

We looked into the relationship between EI and gender, which was not significant. Namdar et al. suggested that this relative evenness might be due to females suppressing their emotions in current Iranian society [18]. Also from family perspective, children are brought up differently according to their gender e.g. boys are nurtured and punished more physically than girls and it can affect their emotions [36,37]. So we can conclude that this equality is due to society and it is

not affected by SUMS or medical education since this equality is observed in both junior and senior students. But there is something unclear about this. Namdar et al. suggested that suppression of emotions causes EI to decrease but EI controls emotions and not the other way around. Is their relationship interrelated? Geng et al. found that there is a negative relationship between emotional exhaustion and EI [38]. As we consider emotional exhaustion as a state of emotional depletion, can we conclude that their relationship might be interrelated? Findings of Geng et al. points out their relationship. In fact, he suggests that people with higher EI tend to be less emotionally exhausted [38]. So it can be concluded EI is the cause and emotional exhaustion is the effect. Furthermore, studies of Ahlgren et al. and Rubino et al. also concluded that females tend to become more emotionally exhausted than males [39,40]. Geng et al. also found that although females had higher emotional exhaustion than males, their EI was not significantly different [38]. We believe that overuse of EI to control emotions (e.g. conditions like emotional depletion) can lead to EI drainage and causes “EI Exhaustion”. So we can conclude that although all people confront stress in their livings, females tend to be more affected and thus, become more emotionally exhausted and as a result, their EI decreases more and the difference of EI between two genders becomes less significant. This theory also supports the findings of Geng et al. because when someone experiences emotional changes, EI is the key to

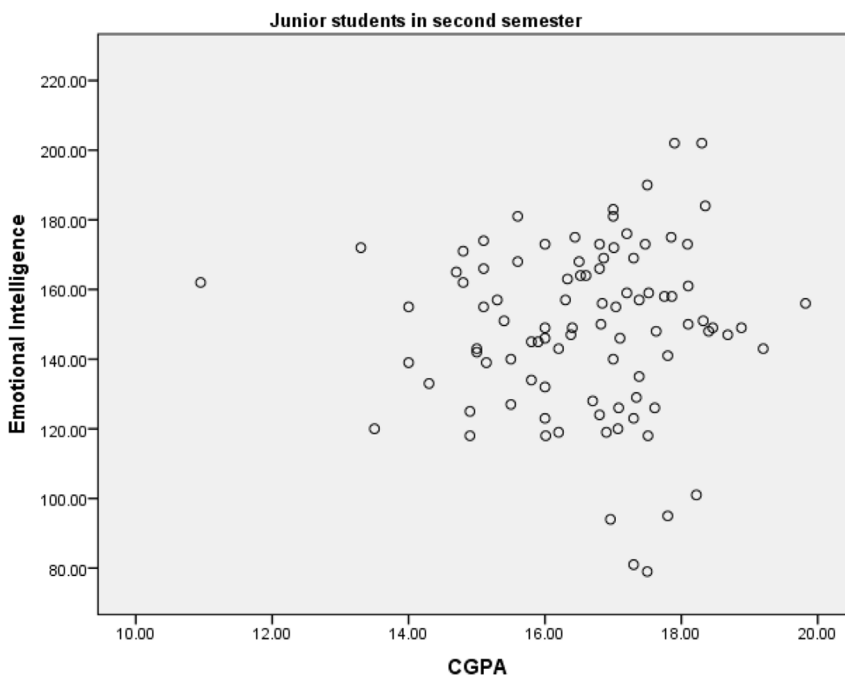


Fig. 2. EI of junior students based on their CGPA.

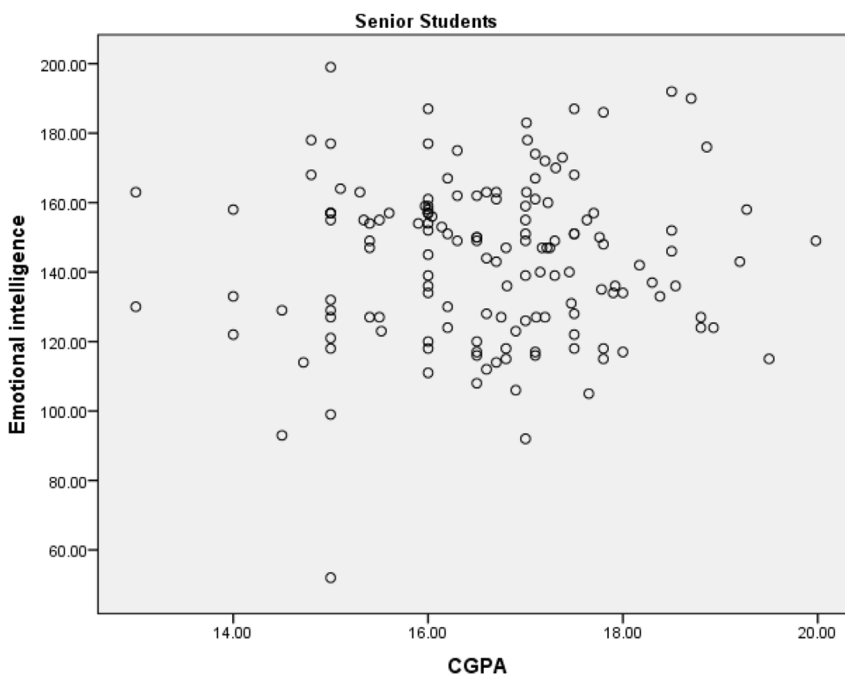


Fig. 3. EI of senior students based on their CGPA.

Table 3

Comparison of EI of junior and senior students between three educational regions.

Zone	N	Total Score	P
Junior Students	1	108	149.314 ± 24.029
	2	82	147.451 ± 21.028
	3	76	151.131 ± 24.255
Senior Students	1	75	142.146 ± 21.332
	2	39	144.128 ± 28.018
	3	49	143.6939 ± 22.817

regulation of it [41].

If we suppose that females did undergo EI exhaustion, can we also suggest that the decrease in EI of senior medical students can be due to their EI being underused and became dull? Or as they progressed toward professionalism, they suppressed their emotions and exhausted their EI? As we stated, these areas need further investigations.

There was no significant relationship between EI and the educational regions. As we considered educational region to be a symbol of accumulation of hometown and culture, it could be suggested that neither was individually contributive to EI. Our finding on this had confirmed the findings of Harrod et al. and Rauf et al. [14,17]. It can also be contradictory of what Marzuki et al. concluded [15]. As all of

the number one educational zone cities have universities and almost all of the number three educational zone are small cities and villages which does not have universities and there was no difference between them, but we cannot be sure unless there is empirical data to confirm it.

Given the same educational protocol that most of the universities in Iran are employing, we suggest to the presidents of universities to consider nurturing their students' EI, a priority, and part of their educational curriculum and evaluation as if not, students will continue ignoring its importance and it could cost their mental health and community's general health as well, so a curriculum for EI development in medical students is needed in every school of medicine. In addition to that, we suggest that hours of shifts and work per month undergo changes so it will not cause EI to decrease significantly but this subject needs further studies. Also, there is a need to assess universities for hidden curriculum and to see if it is beneficial to doctors, patients and the whole educational system. Furthermore, we suggest that further investigations should be made to re-assess the relationship between emotions and EI, usage of EI and its changes and effects of the decrease of females' EI on their roles in society.

This study had some limitations. The main limitation was unavailability and lack of cooperation of students since 70% of junior and senior students contributed to this study. The students also failed to remember their exact CGPA and rank, and wrote it as an approximate. Another limitation was that the translated questionnaire failed to have the validity to assess all five aspects of the original questionnaire.

Ethical approval

This Study was approved by Shiraz University of Medical Sciences' ethics committee with reference number of: IR. sums.med.rec.13. s157.

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This study was funded by Shiraz University of Medical Sciences in analysis and collection.

Author contribution

Ali Vasefi: study design, data collection, data interpretation, writing paper.

Mohammadreza Dehghani: study concept, study design, data interpretation, writing paper.

Mahmood Mirzaaghapoor: data interpretation, writing paper.

Conflicts of interest

This study was funded by Shiraz University of Medical Sciences. The statistical analysis was also provided by Shiraz University of Medical Sciences' statistical consultant.

Research registration number

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Guarantor

The Guarantor is the one or more people who accept full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

Ali Vasefi.

Mohammadreza Dehghani.

Mahmood Mirzaaghapoor.

Consent

Participants' names, initials, or identifying details are no used in the manuscript but because it was requested from them to inform us about their application exam rank, one could identify them if they had their filled questionnaire and knew their rank but due to their rank being protected by ministry of education and Shiraz university of medical sciences, It's practically impossible to identify the participants.

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Written informed consent was obtained from the participants for publication of this study. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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