

# Higher emotional intelligence is related to lower test anxiety among students

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**Background:** For students attending university courses, experiencing test anxiety (TA) dramatically impairs cognitive performance and success at exams. Whereas TA is a specific case of social phobia, emotional intelligence (EI) is an umbrella term covering interpersonal and intrapersonal skills, along with positive stress management, adaptability, and mood. In the present study, we tested the hypothesis that higher EI and lower TA are associated. Further, sex differences were explored.

**Method:** During an exam week, a total of 200 university students completed questionnaires covering sociodemographic information, TA, and EI.

**Results:** Higher scores on EI traits were associated with lower TA scores. Relative to male participants, female participants reported higher TA scores, but not EI scores. Intrapersonal and interpersonal skills and mood predicted low TA, while sex, stress management, and adaptability were excluded from the equation.

**Conclusion:** The pattern of results suggests that efforts to improve intrapersonal and interpersonal skills, and mood might benefit students with high TA. Specifically, social commitment might counteract TA.

**Keywords:** test anxiety, emotional intelligence, students, interpersonal skills, intrapersonal skills

## Introduction

University academic success is related to successfully passing exams. From a cognitive perspective, learning matter must be transferred from working memory into long-term memory from whence stored information must be retrieved and knowledge appropriately applied to specific contexts again via working memory.<sup>1</sup> However, for some students there is a gap between their knowledge and their exam performances.<sup>2</sup> Specifically, some students experience test anxiety (TA), a special case of social phobia.<sup>3</sup> Students with TA often fail to pass exams or to perform at a level consistent with their knowledge because they feel unable to function cognitively and the exam seems to trigger anxiety. For example, Tektaş et al<sup>4</sup> reported a prevalence rate of 29% of TA among German medical students, and Green et al<sup>2</sup> reported that approximately 22% of the US medical students had moderate-to-high TA scores. Furthermore, of students who withdrew from their studies on mental grounds, 62% reported suffering from TA.<sup>5</sup> A further observation is that compared with males, females reported higher TA scores.<sup>4,6-8</sup>

To treat TA, a broad range of cognitive-behavioral and relaxation techniques have been proposed,<sup>9,10</sup> though Green et al<sup>2</sup> reported only modest improvements in TA following a test taking strategy course. This finding might reflect the fact that TA is less of a cognitive or strategic issue and more of emotion regulation. In the light of this possibility, we asked about the relation between TA and so-called emotional intelligence (EI).

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EI is an umbrella term covering a range of intrapersonal and interpersonal skills as well as stress management, adaptability, and mood.<sup>11–13</sup> We hypothesized that EI and TA would be negatively associated. Further, we predicted higher TA scores in female as compared with male participants. We also investigated which of the EI dimension would best predict TA. To this end, 200 medical students took part in the study and completed questionnaires assessing TA and EI.

## Method

### Procedure and sample

A total of 200 medical students (mean age  $M = 21.05$  years;  $SD = 1.28$ ; 66% females,  $M_f = 21.20$  years,  $SD = 1.34$ ;  $M_m = 20.75$ ,  $SD = 1.01$ ;  $t(198) = 2.42$ ,  $P = 0.02$ ,  $d = 0.38$ ) of the Hamadan University of Medical Sciences (Hamadan, Iran) took part in the study. Participants were fully informed about the aims of the study. Most importantly, participants were fully informed about the voluntary basis of participation; they were also informed that questionnaires were completed anonymously, and that participation or nonparticipation would have no advantages or disadvantages for their exams and academic performance. Thereafter, participants gave their written informed consent. During the week in which the spring exams began (spring 2014), they completed a questionnaire booklet covering sociodemographic data, TA, and EI (Emotional Quotient Inventory; [see description of the instruments in the Tools section]). The Institutional Review Board of the Hamadan University of Medical Sciences approved the study, which was carried out in accordance with the ethical standards laid down in the Declaration of Helsinki.

## Tools

### Assessing TA

The Farsi Test Anxiety Inventory by Abolghasemi et al<sup>14</sup> and Ejei et al<sup>15</sup> was applied. It consists of 25 items focusing on thoughts, emotions, and behavior related to anxiety before,

during, and after written and oral tests. Typical items are: “Thinking about my grade in a course interferes with my work in tests” or “I feel confident and relaxed while taking tests”. Answers are given on 4-point rating scale ranging from 0 (= never) to 3 (= often), with higher sum scores reflecting increased TA (Cronbach’s alpha = 0.91).

### Assessing EI

The translated and validated Farsi version<sup>16</sup> of the Emotional Quotient inventory<sup>11</sup> was applied. The self-report inventory consists of 133 items. Items are declarative statements phrased in the first-person singular, and respondents are asked to indicate the degree to which the statement accurately describes them. Answers are given on a 5-point rating scale with anchor points 1 (= not true) and 5 (= true of me); higher scores reflecting higher EI. The following main factors were calculated: intrapersonal skills, interpersonal skills, stress management, adaptability, and general mood (Cronbach’s alpha for the overall scale = 0.88).

### Statistical analysis

First, a series of *t*-tests was performed to compare TA and EI traits between female and male participants. Second, a series of correlations was performed to calculate the associations between TA and EI traits (entire sample and sex split). Third, a multiple regression analysis (stepwise, backward) was calculated to predict TA as a function of EI traits and sex. Statistics was performed with SPSS<sup>®</sup> 21.0 (IBM Corporation, Armonk, NY, USA) for Apple Mac<sup>®</sup>.

## Results

### Sex differences in EI and TA traits

Table 1 reports all descriptive and inferential statistical indices to compare TA and EI scores between female and male participants. While EI scores did not differ between female and male participants, compared with male participants,

**Table 1** Descriptive statistics and correlations between test anxiety and emotional intelligence traits

	Female patients	Male patients	Statistics
N	132	68	
<b>Emotional intelligence traits, mean (SD)</b>			
Intrapersonal skills	23.51 (1.97)	23.77 (2.18)	$t(198) = 0.81$ , $d = 0.11$ [S]
Interpersonal skills	23.77 (1.99)	23.85 (2.37)	$t(198) = 0.24$ , $d = 0.03$ [S]
Stress management	23.24 (2.34)	23.46 (2.64)	$t(198) = 0.60$ , $d = 0.08$ [S]
Adaptability	23.57 (2.03)	24.02 (2.19)	$t(198) = 1.43$ , $d = 0.21$ [S]
General mood	23.42 (2.00)	23.85 (2.37)	$t(198) = 0.96$ , $d = 0.07$ [S]
Test anxiety	34.37 (4.49)	31.60 (7.42)	$t(198) = 2.48$ ,* $d = 0.56$ [M]

Note: \* $P < 0.05$ .

Abbreviations: M, medium effect size; S, small effect size; SD, standard deviation.

**Table 2** Descriptive statistics and correlations between test anxiety and emotional intelligence traits, for the entire sample and separately for sex

	Sample		
	Entire sample	Female participants	Male participants
N	200	132	68
	Test anxiety	Test anxiety	Test anxiety
Emotional intelligence traits	<i>r</i>	<i>r</i>	<i>r</i>
Intrapersonal skills	-0.65***	-0.64***	-0.68***
Interpersonal skills	-0.61***	-0.54***	-0.73***
Stress management	-0.55***	-0.54***	-0.57***
Adaptability	-0.56***	-0.51***	-0.61***
General mood	-0.61***	-0.56***	-0.68***

**Note:** \*\*\* $P < 0.001$ .

female participants reported modest (medium effect size) but statistically higher TA scores.

### Associations between TA and EI traits

All descriptive and inferential statistics are reported in Table 2. Irrespective of sex, EI traits and TA were negatively associated.

### Predicting TA as a function of EI

To predict TA as a function of EI, a multiple regression (stepwise backward) was performed, with TA as dependent variable, and sex (0= male; 1= female) and EI traits as predictors. The equation was as follows:  $R=0.69$ ;  $R^2=0.476$ ; Durbin–Watson coefficient =1.52; intrapersonal skills:  $\beta = -0.23$ ,  $t=3.61$ ,  $P=0.001$ ; interpersonal skills:  $\beta = -0.24$ ,  $t=3.00$ ,  $P=0.001$ ; general mood:  $\beta = -0.20$ ,  $t=2.38$ ,  $P=0.05$ . In other words, intra- and interpersonal skills and general mood were significant predictors of TA. Stress management ( $\beta = -0.04$ ,  $t=0.23$ ,  $P > 0.45$ ), adaptability ( $\beta = -0.09$ ,  $t=0.98$ ,  $P > 0.32$ ), and sex ( $\beta = 0.12$ ,  $t=1.78$ ,  $P > 0.21$ ) were excluded from the equation.

### Discussion

The key findings of the present study are that among a sample of Iranian medical students, lower TA was associated with higher EI. Specifically, better inter- and intrapersonal skills and general mood, but not stress management, adaptability, or sex predicted TA.

We hypothesized that TA and EI would be negatively associated and this was confirmed. Accordingly, our findings are consistent with the view that emotional regulation and low TA are interlinked. Further, as shown in Table 2, the pattern of results did not differ between female and male participants.

Next, we expected higher TA scores in female as compared with male participants, and this was also

confirmed. Accordingly, the present pattern of results is in accordance with those results observed in schoolchildren,<sup>8</sup> adolescents,<sup>6</sup> and university students.<sup>7,17</sup> However, the difference was modest (medium effect size).

Next and most importantly, results from the multiple regression analysis suggest that, statistically, “mere” emotional regulation had an influence on TA, but cognitive strategies such as stress management and adaptability did not. In this regard, we speculate that this pattern of results makes some sense of previous findings that, on the one hand, a test taking strategy course, understood as cognitive strategies for coping with TA, basically failed to reduce TA,<sup>2</sup> while on the other hand, relaxation techniques such as breathing control, autogenic training, or Mindfulness-Based Stress Reduction turned out to be much more successful in reducing TA.<sup>9,10</sup> Most importantly, it is possible to raise EI through psychotherapeutic interventions; Jahangard et al<sup>16</sup> produced improvements in the EI of patients with borderline personality disorders after teaching EI, relative to a control condition.

The quality of the data does not allow a deeper understanding of the underlying psychological mechanisms, although we speculate that theories by Eysenck et al<sup>18</sup> might be able to explain, why cognitive performance dramatically decreases with TA: Eysenck et al<sup>18</sup>, Eysenck and Byrne<sup>19</sup>, Eysenck and Calvo<sup>20</sup> proposed a “mere” cognitive model in which cognitive resources and attention needed to solve exam questions allocated to cope with anxiety and current concerns.<sup>1</sup> While there is basically no contradiction between the model by Eysenck et al<sup>18</sup> and the present results, we speculate and believe that reducing TA requires not only techniques to improve working memory, but also require techniques to reduce anxiety. In this respect, speculatively, it also seems likely that improving students’ intra- and interpersonal skills would be more successful in reducing TA.<sup>16</sup>

In our view, this is also consistent with research on stress and hardiness,<sup>21</sup> in which commitment, understood as the feeling of being related to and responsible for those close to the self, has been found to be one of the main factors for both preventing and coping with stress.

Despite the intriguing findings, the following caveats warrant against overgeneralization. First, the sample was rather small, and medical students might be under greater pressure to achieve in exams because of the rigorous selection involved. Second, only students able and willing participated in the study. Third, we relied entirely on self-reports, whereas experts' ratings might have allowed further insight into possible psychiatric disorders and comorbidities. Fourth, the present pattern of results might have emerged due to further latent, but unassessed variables, which might have biased two or more dimensions in the same direction. Fifth, participants completed anonymously the questionnaire before starting the exams. As a result, the present data of EI and TA could not be matched with the results of the exams (pass/fail; grades). Future studies should compare dimensions of EI and TA with the objective performance.

## Conclusion

Among a sample of Iranian students, irrespective of sex, lower TA and higher EI were associated. The pattern of results suggests that improving students' interpersonal and intrapersonal skills might reduce TA.

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## Disclosure

The authors report no conflicts of interest in this work.

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