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Evaluation of the emotional intelligence levels of students from different years of the medical course: a cross-sectional study

ÍSIS MAGALHÃES FUJII[1], MARCELA NACUR PIMENTA[1], MARAYRA INÊS FRANÇA COURY[2]

[1] DOCENTE DA FACULDADE CIÊNCIAS MÉDICAS DE MINAS GERAIS – BELO HORIZONTE, MG- BRASIL
[2] DISCENTE DA FACULDADE CIÊNCIAS MÉDICAS DE MINAS GERAIS – BELO HORIZONTE, MG- BRASIL

CORRESPONDING AUTHOR: MARAYRA INÊS FRANÇA COURY – RUA SANTO ANTÔNIO DO MONTE, 246/600. SANTO ANTÔNIO – ZIP CODE: 30330-220 – BELO HORIZONTE, MG – BRAZIL.
EMAIL: MARAYRAFC@GMAIL.COM

ABSTRACT

Introduction: Emotional intelligence (EI) encompasses abilities that help deal with environmental demands and stress factors. It is directly involved with medical practice and education since high levels of EI can contribute to a better physician-patient relationship, help with communication skills and group tasks, and help deal with stress. **Objective**: Evaluate and compare the levels of EI among medical students attending their second, fourth, or sixth year at a University using the Schutte Self-Report Emotional Intelligence Test and evaluate the factors that influence the levels of EI. **Method**: A cross-sectional study involving medical students was conducted. The data was collected through an online questionnaire. The variables were submitted to the Anderson-Darling normality test, the Mann-Whitney U test, and the Kruskal-Wallis test. **Results**: Participants tended to have higher scores related to managing other's emotions as they progressed in the course, but no difference was observed in the total score and other categories. There was a significant difference between the 'managing own emotions' category when compared by gender. There was a positive relation between extracurricular activities, previous degree, age, and higher levels of EI, as well as a significant difference in managing other's emotions when comparing the presence or absence of mental health diagnosis. **Conclusion**: EI is an ability that seems to develop throughout the years. It is important to study and develop techniques to enhance that ability, aiming to improve doctor-patient and interpersonal relationships.

Keywords: Emotional intelligence; Medical education; Interpersonal relations.

INTRODUCTION

Emotional Intelligence (EI) is the ability to perceive, value, and express one's own feelings and emotions, as well as the ability to understand and control them. In addition to this definition, scholars have developed mixed models to define EI, such as the Bar-On and Goleman's model. Bar-On describes it as a set of emotional and social knowledge and skills influencing environmental demands. Goleman includes aspects like personality, self-awareness, empathy, self-control, and self-motivation in his definition of EI.

Unlike "General Intelligence", which includes cognitive abilities like verbal comprehension, problem-solving, and reasoning, EI is a set of non-cognitive competencies related to responding to environmental demands and stress factors. The field of study in EI has grown in recent years as researchers seek to understand its influence on various aspects of an individual's life.

EI is directly related to medical practice and education, as it contributes to a better doctor-patient relationship, improves communication and teamwork skills, aids in positive stress management, and enhances academic success. For healthcare professionals, mastering their emotional intelligence and using emotions to support reasoning allows for better handling of daily professional situations, such as delivering bad news and establishing a doctor-patient relationship that requires understanding the patient's emotions beyond their clinical condition.

Low levels of EI have been associated with higher rates of depression, anxiety, violence, drug and alcohol use, and lower academic performance. Additionally, a frequent criticism of doctors is their lack of communication skills and empathy with patients, which can be improved by incorporating educational practices aimed at developing emotional intelligence in medical education, as EI influences the learning of professionalism and communication skills.

However, most medical school curricula do not include strategies that develop EI. Therefore, it is crucial to understand the influence of EI on medical education and the factors that interfere with and measure this competency among students to seek ways to improve this skill in medical education.

METHODS

Study Design

This is a cross-sectional observational study conducted among students in the second, fourth, and sixth years of medical school at *Faculdade Ciências Médicas de Minas Gerais* in *Belo Horizonte, Minas Gerais, Brazil.* Data was collected through an online form created with *Google Forms* and distributed via *WhatsApp* and email to the students. The questionnaire was only applied to those participants who read and accepted the Informed Consent Form (ICF).

Sample

Medical students officially enrolled in the second, fourth, or sixth years of the medical course at the institution were included. Participants from other educational institutions or academic years and individuals with irregular enrollment were excluded.

The sample size was calculated to be 260 participants based on the t-distribution. However, during data collection, student participation was lower than expected, resulting in 201 responses, which is lower than the ideal sample size.

Instruments

To assess emotional intelligence levels, the Self-Report EI Test (SSEIT) developed by Schutte et al. was used, and the Portuguese translation by Toledo Duca and Coury was applied. The questionnaire consists of 33 items that evaluate the global level of emotional intelligence and the four domains: emotion perception, utilizing emotions, managing self-relevant emotions, and managing others' emotions.

Each item had five response options, ranging from *1—strongly disagree* to *5—strongly agree*. For each question, participants had to select the response that best matched their opinion. The final score corresponds to the sum of the scores of each item, with the values for questions 5, 28, and 33 being inverted before processing. The total score ranges from 33 to 165 points. Additionally, specific scores were calculated for the four emotional intelligence domains.

A personal identification questionnaire was applied to collect variables such as gender, age, marital status, previous complete degree, extracurricular participation (teaching assistant, scientific research, outreach activities), and self-reported mental health diagnosis.

Procedures

The project was approved by the Research Ethics Committee (REC) in November 2022 (opinion no. 5.793.974), and data collection took place between February and May 2023. Recruitment was done by convenience, and the study was broadcast via WhatsApp, email, and in person. Participation was voluntary, with no financial compensation or costs to participants, and they could only respond after reading and agreeing to the ICF.

The 33 items of the SSEIT were answered by participants, and anonymity was preserved through a system of assigned numbers for participant identification. Data were collected confidentially and only made available to the researchers involved in the study. The final score was manually calculated and analyzed to assess the general emotional intelligence level and differences between students in the second, fourth, and sixth years, as well as to assess the influence of factors such as age, gender, and extracurricular activities.

Statistical Analysis

Categorical variables were presented as absolute and relative frequencies, while numerical variables were presented as mean ± standard deviation and/or median. Numerical variables were tested for normality using the Anderson-Darling test, and a comparison of SSEIT scores and other numerical variables between the three groups was done using the Kruskal-Wallis test, with the Mann-Whitney U test used for comparisons between the two groups. The chi-square test was used to evaluate possible associations between categorical variables. A significance level of 5% was used, and data were analyzed using R version 4.0.3 software.

RESULTS

A total of 201 students participated in the research and signed the Informed Consent Form (ICF). Participants who answered the form more than once had only their first response included in the analysis. Thus, the final sample consisted of 193 students, with 82 (42%) from the second year, 79 (41%) from the fourth year, and 32 (17%) from the sixth year of medical school.

The majority of participants (76%) were female and 24% were male. Table 1 shows other characteristics of the participants. The average age of participants was 22.5 years, and the median was 22 years.

Table 1. Participant Data Characterization

Variables Analyzed	**N = 193**
Age (completed years)	22.00 (20.00 – 24.00)
Gender	
Female	147 (76%)
Male	46 (24%)
Marital Status	
Married	4 (2.1%)
Single	189 (98%)
Previous full degree?	
No	172 (89%)
Yes	21 (11%)
Extracurricular activity?	
Extension activity	
No	151 (78%)
Yes	42 (22%)
Teaching assistant activity	
No	74 (38%)
Yes	119 (62%)
Research activity	
No	146 (76%)
Yes	47 (24%)
Non-related activity	
No	137 (71%)
Yes	56 (29%)
Internship	
No	187 (97%)
Yes	6 (3.1%)

Others	
No	191 (99%)
Yes	2 (1.0%)
Year of medical course	
2nd year	82 (42%)
4th year	79 (41%)
6th year	32 (17%)

A total of 72 participants (37%) reported a previous mental health diagnosis, while 121 (62%) denied having one. Among those reporting a diagnosis, anxiety and depression were the most common conditions, followed by attention deficit hyperactivity disorder (ADHD).

In terms of the average total scores and the four emotional intelligence domains analyzed by SSEIT, the average scores according to the academic year are shown in Table 2.

The Kruskal-Wallis test was used for age and year of the course, as it is more appropriate for variables with three or more groups.

For age comparison, participants were divided into three groups: those under 25 years, with a mean total score of 125.17; those aged 26 to 35, with a mean score of 132.63; and those over 35 years, with a mean score of 142.67. The Wilcoxon multiple comparison test revealed a p-value of 0.032 when comparing the "under 25 years" and "26 to 35 years" age groups, indicating a significant difference in scores between these age groups. Comparing the "under 25 years" group with the "over 35 years" group, the p-value of 0.059 suggests that the difference is not statistically significant at the 5% significance level. Comparing the "26 to 35 years" and "over 35 years" groups, the p-value was 0.339, indicating no statistically significant difference.

Table 2. Average and Standard Deviation of Total and Specific Scores by Year of the Course

Variable	Overall	Second Year	Fourth Year	Sixth Year
Total Score	126.18	122.45	128.66	129.59
Perception of Emotions	35.61	34.18	36.66	36.66
Managing Own Emotions	35.04	34.11	35.49	36.31
Managing Others' Emotions	31.21	30.24	32.03	31.66
Use of Emotions	24.32	23.91	24.48	24.97

Regarding the score evaluating emotion perception, the average was 35.13 for students under 25 years, 39.05 for students between 26 and 35 years, and 41 for those over 35 years. These results once again indicate an increase in emotion perception scores as age advances. The multiple comparison test shows a significant difference between the "under 25 years" and "26 to 35 years" groups (p=0.011).

When comparing the different years of the course, significant differences were observed only in the scores for managing others' emotions between the different academic years. The analysis of the means shows an average score of 30.24 for second-year medical students, 32.03 for fourth-year students, and 31.66 for sixth-year students. The multiple comparison test shows a significant difference in scores between second and fourth-year students with a p-value of 0.012. However, when comparing second and sixth-year students, the p-value was 0.204, and the comparison between sixth and fourth-year students resulted in a p-value of 0.592. Overall, there was an increase in managing others' emotions scores as students progressed through the course, more evident between the second and fourth years than between the fourth and sixth years.

DISCUSSION

This study aims to compare emotional intelligence (EI) levels among medical students in their second, fourth, and sixth years of the undergraduate course at a private institution. Additionally, specific objectives included evaluating the influence of gender, age, marital status, year of study, previous degree, participation in extracurricular activities, and a previous mental health disorder diagnosis on the EI levels of the participants.

The overall total score was high (126.18±16.48), with a gradual increase as students advanced through the years of the course, although this difference was not statistically significant (p=0.057). The total score for second-year students was 122.45±18.23, for fourth-year students, it was 128.66±14.35, and for sixth-year students, it was 129.59±15.22. However, the global score approaches statistical significance, suggesting that with a larger sample size, the difference between the groups could become evident.

It is noteworthy that second-year students exhibited greater variability in their scores, as evidenced by a standard deviation of 18.23. The domains of emotion perception, managing one's own emotions, and use of emotions did not show statistically significant differences either.

In the domain of managing others' emotions, the average score was 30.24 for second-year students, 32.03 for fourth-year students, and 31.66 for sixth-year students. The multiple comparison test demonstrated a significant difference between second and fourth-year students, with a p-value of 0.012. However, when comparing second and sixth-year students, the p-value was 0.204, and the comparison between fourth and sixth-year students yielded a p-value of 0.592. In general, the results suggest an increase in managing others' emotions as students progress through the course, more clearly from the second to the fourth year than from the fourth to the sixth year. This finding aligns with a study conducted by Chew et al. and another by Todres et al., in which final-year medical students exhibited similar levels of emotional intelligence but with higher scores in understanding others' emotions. These results suggest that curricular practices applied during medical school may have contributed to training skills related to handling others' emotions, with little impact on emotional self-perception skills.

There was no significant difference in total EI scores between male and female students, except in the managing one's own emotions category, where males had an average score of 37, compared to 34.43 for females (p=0.015). This finding contrasts with much of the literature available, indicating that women tend to have higher EI levels than men due to better interpersonal communication and emotional expression skills. However, other studies have also shown no gender differences. Additionally, it is worth noting that the number of female participants was much higher than that of males, which could influence this comparison given the unequal group sizes.

Participants with a previous complete degree showed higher scores in all EI domains, except for managing others' emotions. This result aligns with a study by Coury et al., which found that individuals with a prior degree had a greater capacity for perceiving emotions. This may be related to the fact that participants with a previous degree had a higher average age

(28.76 years) than those without one (21.76 years), acting as a confounding factor.

Regarding age, the average total scores indicated that, as age increases, the total EI score tends to be higher. This increase was also observed in the emotion perception domain, which tends to be better in the age group over 35. A study by Bitar et al. demonstrated that students aged 25-29 had higher emotional intelligence levels than those under 25. This result can be explained by the fact that EI is trainable, and people can improve these skills over time, with older individuals having more interpersonal and intrapersonal experiences that contribute to higher scores.

Regarding the presence of a mental disorder diagnosis, 37% of the sample reported having such a diagnosis. Among the mental disorders, anxiety and depression were the most prevalent, as reported in other studies with medical students, including a recent meta-analysis showing that one in three medical students suffer from anxiety. A study by Doyle et al. showed that in addition to the high incidence of depression, anxiety, and stress among medical students, individuals with a diagnosis of one of these disorders had significantly lower EI levels than those without the diagnosis. However, in this study, there was only a statistically significant difference in managing one's own emotions, with a score of 32.96 for those with a diagnosis and 36.28 for those without (p=0.0004). This low correlation may be related to the fact that many people do not have a definitive diagnosis of anxiety but exhibit symptoms of the disorder and suffer its consequences without marking the disorder in the evaluation.

A study by Fernandez-Berrocal, Alcaide, and Extremera found that poor psychological adjustment could be associated with difficulty in identifying feelings and managing one's own emotions. Additionally, the impact of EI on better emotional response management can affect how students handle challenging situations in medical practice.

There was a positive correlation between participation in extracurricular activities and higher EI levels. Individuals involved in extracurricular activities had an average total score of 127.62, compared to 120.98 for those who did not participate (p=0.049). In a study by Ranasinghe et al., the same correlation was observed, suggesting that extracurricular activities contribute to the personal capacity to be attentive and better express emotions, as well as provide experiences that allow for handling interpersonal relationships. Moreover, Bitar et al. demonstrated that medical students with leadership experience had higher EI levels, which could explain the positive correlation associated with extracurricular activities, where students often have leadership and initiative experiences. In this context, it is worth considering implementing EI training activities in the curriculum aimed at developing student leadership and initiative.

The limitation of this study was the sample size (193), which was smaller than the initially projected size of 260 due to recruitment difficulties.

CONCLUSION

Based on the analysis of the collected data regarding the EI levels of the participants, it can be concluded that there was a tendency for increased scores in managing others' emotions, as measured by the SSEIT, as students progressed through the course. However, there was no significant difference in the total EI score or other domains. This is likely due to the acquisition of communication and empathy skills throughout medical school, which can be trained with more frequent contact with clinical practice and the inclusion of subjects focused on good medical practice. It is worth noting that the global score is close to statistical significance, suggesting that with a larger sample size, the difference in total EI scores between groups could be confirmed.

There was a significant difference between the scores for managing one's own emotions when compared by gender, with the male average being higher than the female average.

A positive correlation was observed between EI levels and participation in extracurricular activities, which may be associated with more opportunities for training EI-related skills, such as interpersonal communication and emotional expression. A positive correlation was also observed between having a previous degree and higher EI levels, except for the domain that measures managing others' emotions. However, age acts as a confounding factor since older individuals tend to score higher than younger individuals.

Additionally, a high prevalence of mental disorders was observed among medical students, particularly anxiety and depressive disorders. However, there was only a significant difference in the domain of managing one's own emotions, where the average score was higher among the group without a mental disorder diagnosis compared to the group with a diagnosis.

Thus, it is concluded that emotional intelligence is a skill that seems to develop over the years, and it is important to study and develop techniques to improve it, aiming to enhance the quality of doctor-patient and interpersonal relationships in general, as well as the management of one's own emotions.

REFERENCES

1. Mayer, J. D., & Salovey, P. What is emotional intelligence? In P. Salovey & D. Sluyter (Eds.), Emotional development and emotional intelligence: Implications for educators (pp. 3-31). New York: Basic Books. (1997)
2. Mayer, J. D., Salovey, P., & Caruso, D. R. Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) user's manual.Toronto, Canada: MHS. (2002).
3. Bar-On R.. The emotional intelligence inventory (EQ-I): Technical manual. Toronto, Canada: Multi-Health Systems. (1997)
4. Goleman D. La inteligencia emocional. México, D.F.: Vergara; 2001. p. 197.
5. Hernández-Vargas CI, Dickinson-Bannack ME. Importancia de la inteligencia emocional en Medicina. Investig En Educ Medica [Internet]. Jul 2014;3(11):155-60.
6. Woyciekoski C, Hutz CS. Inteligência emocional: teoria, pesquisa, medida, aplicações e controvérsias. Psicologia [Internet]. 2009 ;22(1):1-11.
7. Hogeveen J; Salvi C; Grafman J. 'Emotional Intelligence': Lessons from Lesions. Trends in Neurosciences. Vol 39,10. 2016.
8. Johnson D. R. et al. Emotional intelligence as a crucial component to medical education. International Journal of Medical Education, 6: 179-183. 2015.
9. Abe K. et al. Associations between emotional intelligence, empathy and personality in Japanese medical students. BMC Medical Education. 2018.
10. Arora S. et al. Emotional intelligence in medicine: a systematic review through the context of the ACGME competencies. Medical education, Vol. 44, 749-764. 2010.
11. Coury M. I. F. Avaliação do nível de inteligência emocional em estudantes de medicina de diferentes períodos da graduação. Estudo Transversal, Belo Horizonte, 2017-2018. Universidade José do Rosário Vellano- Unifenas. 2019.
12. Júnior A. T; Duca J. G. M; Coury M. I. F. Tradução e Adaptação Transcultural de Versão Brasileira do Schutte Self-Report Emotional Intelligence Test. Revista Brasileira de Educação Médica, 42 (4):109-114; 2018.
13. Bamberger E. et al. A pilot study of an emotional intelligence training intervention for a pediatric team. Archives of Disease in Childhood, v. 102, n. 2, p. 159–164, 13 out. 2016

14. Carrothers RM, Gregory SW Jr, Gallagher TJ. Measuring emotional intelligence of medical school applicants. Acad Med 2000;75:456–63.
15. Ogińska-Bulik N. (2005). Emotional intelligence in the workplace: Exploring its effects on occupational stress and health outcomes in human service workers. International Journal of Occupational Medicine and Environmental Health. 18, 167-175.
16. Wagner PJ, Moseley GC, Grant MM, Gore JR, Owens C. Physicians' emotional intelligence and patient satisfaction. Fam Med 2002;34:750–4.
17. Silva JTN, Toledo Júnior A. Association between emotional intelligence and empathy among medical students: a single center cross-sectional study, Brazil, 2019. Rev bras educ med [Internet]. 2021;45(1):e042. Available from: https://doi.org/10.1590/1981-5271v45.1-20200053.ING
18. Almeida, A. M. O nível de Inteligência Emocional e o desempenho acadêmico de alunos de Medicina / Emotional Intelligence and academic performance of medical students in a Brazilian medical school. Tese (Mestrado em Ensino em saúde)–Universidade José do Rosário Vellano, Programa de Pós-Graduação Stricto Sensu em Ensino em Saúde. Belo Horizonte, 85p, 2019.
19. Bolfarine H.; Bussab W, O. Elementos de amostragem. São Paulo: ABE – Projeto Fischer. 2005.
20. Schutte N.S., Malouff J.M., Hall L.E., Haggerty D.J., Cooper J.T., Golden C.J., & Dornheim L. (1998). Development and validation of a measure of emotional intelligence. Personality and Individual Differences, 25, 167-177.
21. Schutte N. S.; Malouff J. M.; Bhullar N. The Assessing Emotions Scale, In STOUGH, C.; SAKLOFSKE, D.; PARKER, J. The Assessment of Emotional Intelligence, New York: Springer Publishing, 2009.
22. Chew BH, Zain AM, Hassan F. Emotional intelligence and academic performance in first and final year medical students: a cross-sectional study. BMC Med Educ. 2013;13:44.
23. Todres M. et al. The emotional intelligence of medical students: An exploratory cross-sectional study. Medical Teacher, v. 32, n. 1, p. e42–e48, 1 Jan. 2010.
24. Ranasinghe P. et al. Emotional intelligence, perceived stress and academic performance of Sri Lankan medical undergraduates. BMC Medical Education, v. 17, n. 1, 20 Feb. 2017.
25. Petrides K. V.; Furnham A. Gender Differences in Measured and Self-Estimated Trait Emotional Intelligence. Sex Roles. 2000; 42:449-61.