Original Article

Emotional Intelligence and its Association with Academic Success and Performance in Medical Students

Sulaiman Altwijri[1,2,3], Abdulaziz Alotaibi[1,2,3], Mohammed Alsaeed[1,2,3], Abdulrahman Alsalim[1,4], Abdulrahman Alatiq[1,2,3], Saud Al-Sarheed[1,2,3], Sajida Agha[1,3], Aamir Omair[1,3]

[1]Department of Medical Education, College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, [2]King Abdulaziz Medical City, National Guard Health Affairs, [3]King Abdullah International Medical Research Center, [4]King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia

Abstract

Background: Emotional intelligence (EI) is potentially associated with higher academic performance. However, no study from the Gulf region has previously assessed if EI affects academic success and academic performance in medical students.

Objectives: To examine the relationship between EI and academic success and academic performance in a sample of Saudi Arabian medical students.

Methods: This cross-sectional, questionnaire study included all 4th–6th year medical students enrolled at King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh, Saudi Arabia, in the academic year 2017–18. Eligible students were invited to complete the self-administered Schutte Self-Report Emotional Intelligence Test and the Academic Success Inventory for College Students (ASICS) along with a questionnaire eliciting demographic information between January and April 2018. Academic achievement was assessed based on each student's self-reported grade point average in the most recent examination.

Results: Of 377 eligible students, 296 (78%) completed the questionnaires. A significant association was identified between overall EI and ASICS scores ($r = 0.197$; $P < 0.001$). EI scores were constant in males and females and the year of study. No statistically significant association was observed between EI and academic success across gender and academic years ($P > 0.05$ for all values). However, in terms of external motivation and career decidedness by level of study, final-year students had higher scores compared with students in the other two study years ($P = 0.02$ and $P = 0.01$, respectively).

Conclusion: This study offers primary data on the impact of EI scores on academic success in medical education, and it identified several factors associated with EI and academic success. The findings of this study suggest that EI and academic success are linked, and that both are vital for increasing academic performance.

Keywords: Academic performance, academic success, emotional intelligence, medical students, Saudi Arabia

Address for correspondence: Dr. Sajida Agha, College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia.
E-mail: aghasa@ksau-hs.edu.sa

Submitted: 30-Sep-2019 **Revised:** 27-Jan-2020 **Accepted:** 12-Aug-2020 **Published:** 26-Dec-2020

Access this article online	
Quick Response Code:	Website: www.sjmms.net
	DOI: 10.4103/sjmms.sjmms_375_19

How to cite this article: Altwijri S, Alotaibi A, Alsaeed M, Alsalim A, Alatiq A, Al-Sarheed S, *et al*. Emotional intelligence and its association with academic success and performance in medical students. Saudi J Med Med Sci 2021;9:31-7.

INTRODUCTION

Emotional intelligence (EI) refers to the ability to identify and distinguish emotions in a way that allows them to be used as a guide for achieving certain objectives.[1] The literature suggests that individuals with higher EI form stronger and longer lasting interpersonal relationships,[2] which positively influences general intellectual development and, consequently, contributes to higher academic performance.[3,4] Moreover, the intrapersonal aspect of EI is related to self-motivation and self-regulation, which supports behavioral traits that may enhance academic performance.[2,4] EI is linked with emotional well-being, which improves the academic performance and lowers stress levels in medical students.[5-8]

Several medical regulatory authorities, including the Accreditation Council for Graduate Medical Education, have drawn attention to the importance of key competencies for health professionals, many of which reflect the core components of EI.[9] This highlights the importance of possessing EI in the medical field. Several studies have also identified a strong direct correlation between EI and academic performance.[10-13] Possessing EI as a trait leads to better critical thinking, which is often reflected in a student's grade point average (GPA).[14] Furthermore, individuals with higher EI demonstrate better skills in practical fieldwork.[15] Students with higher EI have also been associated with more effective clinical adaptability and proactivity during their clinical rotations.[16] Hence, identifying reliable predictors of academic performance is essential to demonstrate its association with EI.

As one of the most commonly used predictors of academic performance, although GPA is associated with some statistical limitations, it has proven to be a reliable and consistent measure compared with examination scores and restricted subject evaluations.[17,18] With regard to the variable of academic success, it is related to intangible factors that influence academic performance (e.g., motivation, study habits, exam habits, diligence, quantity of work, quality of study and learning styles).[19-21]

Worldwide, although several studies have reported that a positive correlation exists between EI and academic performance, some studies have identified no association.[22-25] Importantly, most previous studies were conducted in Western cultures, and they may not be generalizable to non-Western cultures due to the potential influence of cultural values and religious beliefs on EI. In the Middle East, to the best of the authors' knowledge, only one such study has previous been conducted,[26] thereby highlighting the need for conducting additional comprehensive studies in the Middle Eastern context. Therefore, this study was undertaken to explore more deeply the association between EI and academic success and academic performance among medical students from a university in the Kingdom of Saudi Arabia (KSA).

METHODS

Design, setting and participants

This cross-sectional, questionnaire study included all 4th–6th year medical students enrolled at King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh, Saudi Arabia, in the academic year 2017–18. The study was conducted between January and April 2018.

KSAU-HS is a public university located in Riyadh and Jeddah. The Riyadh campus has separate branches for male and female students, with around 1200 medical students in total. The curriculum, which is a shared responsibility between basic sciences and clinical faculties, is delivered in a problem-based format, paired with personal and professional development sessions, physician–patient themes and other relevant activities. As senior students have more experience with academic life, all male and female medical students in Phase II (preclinical; 4th year) and Phase III (clinical; 5th and final year) (n = 377) were invited to participate in this study.

Data collection tool and procedure

Academic achievement was assessed using a self-reported GPA for each student's last examination. Self-reported data were used because the university's confidentiality policy prohibits access to records maintained by the assessment unit. At KSAU-HS, continuous assessment of students accounts for 40% of their total mark, and final assessment, conducted at the end of the second semester, accounts for the remaining 60%. The semester GPA is calculated based on the total quality points a student has earned, divided by the credit hours assigned for all courses taken in each semester.

The study initially collected demographic data such as gender, year of study and their last GPA through a questionnaire. Then, two additional questionnaires were administered: the Schutte Self-Report Emotional Intelligence Test (SSEIT)[27,28] and the Academic Success Inventory for College Students (ASICS).[29] SSEIT is a 33-item questionnaire that uses a 5-point Likert-type scale to measure EI traits. The instrument measures the expression of emotion (13 items), regulation of emotion (10 items) and utilization of emotion (10 items), with scores ranging from

33 to 165. The 50-item ASICS instrument was designed to assess factors that inform academic success in students. It consists of the following factors: general academic skills, career decidedness (i.e., deciding on career goals), internal and external motivation, lack of anxiety, concentration, socializing, personal adjustment and perceived efficacy of the instructor. For ASICS, 22 items with high predictive validity were included. A pilot study was conducted, wherein 30 eligible students completed the questionnaire and the Cronbach's alpha coefficient was 0.70; the results of these students were not added to the final analysis. Since the questionnaires were not available for online use at the time of the study, permission to use them were obtained from the authors via E-mail.

All remaining eligible students were invited to participate in mid-January 2018 through an institutional E-mail circular that comprised the link to the two questionnaires and demographic data. After the initial contact, two additional E-mail reminders were sent in mid-February and late March 2018 to all those who had not responded. Participation was voluntary and no incentives were offered.

Ethical approval was obtained from the Institutional Review Board (IRB) at King Abdullah Medical Research Center, the Ministry of National Guard Health Affairs, Riyadh, Saudi Arabia. A voluntary electronic informed consent was obtained from all participants in the first page of the questionnaire. All responses were kept confidential and securely maintained.

Statistical analysis

To submit the questionnaire, all questions needed to be answered mandatorily. Data cleaning and entry was undertaken before analysis. All data were analyzed using SPSS version 20 (IBM Crop., Armonk, NY, USA). The quantitative variables (e.g., age and GPA) were presented as mean and standard deviation, whereas categorical data were presented in the form of counts and percentages. Independent sample *t*-tests were used to compare the mean percentage score of each domain of EI across gender, GPA and academic success. Multivariate analysis of variance (MANOVA) was also used to assess the effect of gender and academic success on the variables of EI and those identified through ASICS data. $P < 0.05$ was considered statistically significant.

RESULTS

A total of 296 students from the 377 eligible participants completed the questionnaires, resulting in a response rate of 78%. The mean age of the participants was 23.3 (±1.0) years, and 51.7% were male. In addition, 4th-year students were overrepresented compared with the total number of students at each level of the program. The sociodemographic characteristics of the participants are detailed in Table 1.

A comparison of the students' GPA, EI and ASICS scores is given in Table 2 and Figure 1a, b. A significant and positive relationship was identified between GPA and overall EI ($r = 0.129$; $P < 0.05$). Academic achievement was also significantly and positively associated with overall EI ($r = 0.197$; $P < 0.001$). For the SSEIT domains, the interaction was removed from MANOVA (Wilks' Lambda = 0.96; $F = 1.51$; $P = 0.151$; $\eta = 0.021$). Gender was not significant in the MANOVA multivariate table (Wilks' Lambda = 0.99; $F = 1.1$; $P = 0.356$; $\eta = 0.015$). Year of study was borderline significant (Wilks' Lambda = 0.95; $F = 1.72$; $P = 0.091$; $\eta = 0.023$), and neither gender nor academic level had an impact on any of the SSEIT domains ($P > 0.05$ for all values) [Table 3].

For the ASICS domains, the interaction was removed from MANOVA (Wilks' Lambda = 0.92; $F = 1.61$; $P = 0.056$; $\eta = 0.049$). Gender was significant in the MANOVA

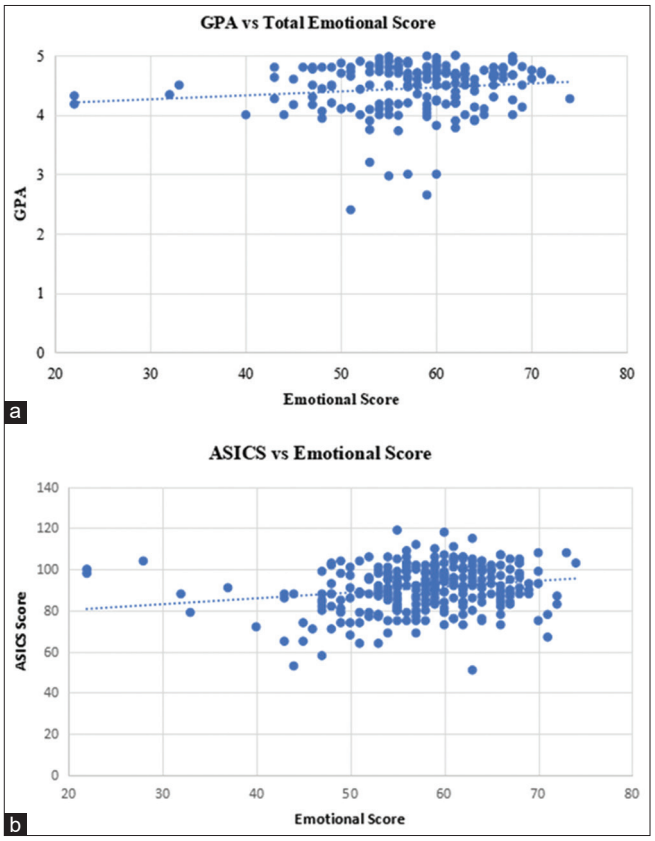

Figure 1: The distribution of emotional intelligence score and (a) total grade point average and (b) Academic Success Inventory for College Students scores

Table 1: Demographic information of the study participants (*n*=296)

Factors	*n* (%)
Year of study	
6th	80 (27.0)
5th	123 (41.6)
4th	93 (31.4)
Gender	
Male	153 (51.7)
Female	143 (48.3)
Father's education	
Elementary	18 (6.1)
Intermediate	8 (2.7)
High school	48 (16.2)
College	114 (38.5)
Masters or PhD	108 (36.5)
Mother's education	
Elementary	31 (10.5)
Intermediate	13 (4.4)
High school	68 (23.0)
College	144 (48.6)
Masters or PhD	40 (13.5)
Last GPA	
<2-2.99	3 (1.0)
3-3.99	27 (9.1)
<4	266 (89.9)

GPA – Grade point average

Table 2: Overall comparison of grade point average, emotional intelligence and Academic Success Inventory for College Students (*n*=296)

Variables	GPA	Total EI	Total ASICS
GPA			
Pearson correlation	1	0.129*	0.075
Significant (two-tailed)		0.031	0.211
n	279	279	279
Total EI scale			
Pearson correlation	0.129*	1	0.197**
Significant (two-tailed)	0.031		0.001
n	279	296	296
Total ASICS			
Pearson correlation	0.075	0.197**	1
Significant (two-tailed)	0.211	0.001	
n	279	296	296

*Correlation is significant at the 0.05 level (two-tailed); **Correlation is significant at the 0.01 level (two-tailed). GPA – Grade point average; EI – Emotional intelligence; ASICS – Academic Success Inventory for College Students

multivariate table (Wilks' Lambda = 0.91; $F = 3.05$; $P = 0.002$; $\eta = 0.088$), and so too was year (Wilks' Lambda = 0.88; $F = 1.98$; $P = 0.009$; $\eta = 0.059$). In the case of "External Motivation/Current and Future" and "Socializing," these were higher for males than females ($P = 0.003$). As for "Internal motivation/Confidence" and "External Motivation/Current and Future," these were significantly different across the academic levels ($P = 0.02$ and $P = 0.01$, respectively) [Table 4].

DISCUSSION

Consistent with our objective, the analysis indicated that academic performance, as proxied using a student's most recent GPA score, was positively associated with EI. Our results affirm the findings reported elsewhere in the literature, which suggest that EI and academic performance are positively associated.[30] It may help interpret our findings that EI is the area of general intelligence that represents informative and practical aspects of emotional processes (e.g., understanding, expression and use of emotions), all of which are likely to have a positive impact on individual's performance abilities as well as their motivation to thrive in life.[31,32]

Comparison of EI scores against the components of academic success revealed a significant and positive association for 3 of the 9 studied components. This indicates that students with high EI tend to display strong socialization skills and high motivation to achieve career goals, and they trust their tutors' efficacy. These findings are similar to those of several previous studies that have examined the effect of high EI and academic success on students in clinical settings.[33] In terms of performance, students can enhance their capabilities and foster self-regulatory skills due to EI.[34] In addition, students with higher EI tend to understand and collect information in a way that is suitable to their academic and social environment. Such students were also more likely to refrain from behaviors that could hinder academic achievement.[35] While low EI is closely associated with poor cognitive abilities (e.g., in terms of concentration, memory and retrieval of information) and ineffective communication skills,[36] we can infer that recognizing the importance of factors influencing EI and academic success may assist in planning and implementing activities that improve personal, professional and clinical skills in medical students.

Regarding the association between EI, academic success, academic performance and level of study, our results revealed no significant association between EI and level of study. Specifically, total EI scores did not differ significantly between clinical and preclinical students. The results of this study support those of other studies on EI and academic success.[37] However, although higher EI has been shown to improve patient satisfaction and an individual's handling of clinical situations, the study reported no relationship between EI, academic performance, year of study and experience.[37-39] Our findings are inconsistent with a study from the United States, which involved a sample of 2nd-year, 3rd-year and 5th-year students, and which reported on a significant association between EI and performance in problem-based learning sessions.[40] With these considerations in mind, it is clear that further research is essential.

Table 3: Comparison of the different domains of emotional intelligence by gender and academic level

Domains of Emotional Intelligence	Mean (±SD)		*P*	Mean (±SD)			*P*
	Male (*n*=153)	Female (*n*=143)		6th year (*n*=80)	5th year (*n*=123)	4th year (*n*=93)	
SSEIT total score	58.2 (±6.0)	57.3 (±9.0)	0.34	58.2 (±7.7)	57.3 (±7.9)	58.1 (±7.2)	0.63
Perception of emotion	17.8 (±2.5)	17.4 (±3.0)	0.21	17.9 (±2.6)	17.4 (±2.9)	17.8 (±2.5)	0.44
Managing own emotions	16.6 (±2.5)	16.3 (±3.0)	0.51	17.0 (±2.9)	16.3 (±2.6)	16.2 (±2.7)	0.16
Managing other emotions	15.5 (±2.3)	15.6 (±3.2)	0.89	15.3 (±2.8)	15.5 (±2.7)	15.8 (±2.7)	0.44
Utilization of emotion	8.3 (±1.4)	8.0 (±1.6)	0.14	8.1 (±1.5)	8.1 (±1.6)	8.3 (±1.3)	0.35

P were generated based on the multivariate analysis of variance. SSEIT – Schutte Self-Report Emotional Intelligence Test; SD – Standard deviation

Table 4: Comparison of the different domains of academic success by gender and academic level

Domains of Academic Success	Mean (±SD)		*P*	Mean (±SD)			*P*
	Male (*n*=153)	Female (*n*=143)		6th year (*n*=80)	5th year (*n*=123)	4th year (*n*=93)	
ASICS score	91.0 (±11.7)	90.7 (±10.2)	0.37	90.1 (±10.9)	91.7 (±11.3)	90.5 (10.6)	0.56
General academic skills	11.7 (±3.0)	12.2 (±3.2)	0.16	11.7 (±3.0)	12.3 (±2.9)	11.6 (3.4)	0.20
Internal motivation/confidence	13.7 (±3.1)	13.1 (±3.2)	0.09	13.0 (±3.1)	14.0 (±2.9)	13.0 (±3.5)	0.02
Perceived efficacy of the instructor	12.4 (±2.8)	11.7 (±3.2)	0.09	12.3 (±3.1)	11.9 (±3.1)	12.1 (±2.9)	0.77
Concentration	7.3 (±1.8)	7.6 (±1.7)	0.10	7.5 (±1.8)	7.3 (±1.6)	7.5 (±1.9)	0.66
External motivation/current and future	13.9 (±2.4)	14.5 (±2.0)	0.03	13.5 (±2.3)	14.5 (±2.1)	14.3 (±2.3)	0.01
Socializing	7.7 (±2.6)	7.0 (±2.7)	0.03	7.6 (±2.7)	7.1 (±2.7)	7.6 (±2.6)	0.24
Career decidedness	7.7 (±3.0)	7.4 (±3.2)	0.55	8.2 (±2.9)	7.3 (±3.2)	7.2 (±3.1)	0.07
Lack of anxiety	8.4 (±2.3)	8.7 (±2.1)	0.29	8.2 (±2.0)	8.7 (±2.3)	8.8 (±2.2)	0.13
Personal adjustment	8.3 (±2.5)	8.4 (±2.3)	0.72	8.1 (±2.4)	8.5 (±2.5)	8.4 (±2.3)	0.54

P were generated based on the multivariate analysis of variance. ASICS – Academic Success Inventory for College Students; SD – Standard deviation

Another finding in this study is related to the role of gender and its association with EI and academic success and academic performance. The results indicated that both academic success and EI score were independent of gender, which is consistent with studies undertaken in Pakistan and Sri Lanka.[34,39] In contrast, studies from the United Kingdom and India have shown that female physicians as well as medical and dental students have higher EI than their male counterparts.[12,25,37,38]

An interesting finding of the current study is regarding the impact of socialization and motivation on academic success, which showed statistically significant associations with a trend of male students who scored effectively in terms of socialization (e.g., the knowledge and skills required to become an active member of the community). In addition, female students tended to achieve higher scores than the male students in terms of motivation. These differences reflect the fact that while socialization and motivation in medical education are critical requirements for effective medical practice, gender may have an impact on styles of practice. Further longitudinal studies are required on the differences and similarities with reference to socialization and motivation among male and female medical students.[41]

The results of this study did not identify a link between EI and academic success. Further review of the subscale of academic success indicates that internal motivation/confidence, external motivation and career decidedness are associated with the level of study. Previously, a study in final-year dental students reported a significant association between EI and meeting friends, physical exercise and recreational activities.[12] Furthermore, training EI capabilities and promoting academic success plays a critical role in medical practice, and it may have a positive influence on physician–patient relationships.[42]

Consistent with this study's findings, it is suggested that the domains of academic success and EI should be given equal importance in our educational institutes. This is because both play a vital role in students' academic achievement. Increased emphasis should be placed on soft skills, including understanding others' emotions, interpersonal skills, personal adjustment and motivation. Currently, in medical colleges in the KSA, the emphasis is primarily placed on academic skills and performance.

To the best of our knowledge, this study is the first in the field of EI and academic success to examine undergraduate medical students in the KSA. However, the study has certain limitations. First, this study was undertaken at only a single public sector college, which could hinder the generalizability of the findings. Second, the GPA was self-reported, which, as a subjective measure, may not be reliable, thus leading to potential bias. Finally, the study's cross-sectional design may inhibit the clear identification of possible causal relationships between the study factors.

Despite the limitations, this study provides information that may be useful for academic institutions, health-care professionals and patients. Knowledge of EI and its effect

in the medical profession can improve the quality of interactions between patients and health-care personnel. In addition to practical implications, this study contributed to the current understanding of how characteristics of EI in academia can be effectively utilized to manage emotions and enhance academic performance in a non-Western culture. The holistic analysis in this study adds to the existing research by identifying important components of academic success that should be considered during the early stages of the learning process that have not been considered previously.

Before arriving at strong and generalizable conclusions, further multicenter research is recommended in this underresearched area. More effort is required to confirm the extant findings, to define the best instrument for assessing academic performance in medical students in a culturally relevant way and to measure the necessary EI abilities at the different levels of undergraduate medical education.

CONCLUSION

This study indicates that, in undergraduate medical students, EI is significantly and positively associated with academic performance. In addition, it suggest that EI is a significant factor that influences external motivation, perceived efficacy of the instructor and socializing. Notably, no significant relationship was identified between EI and academic success scores across genders and different years of study.

Acknowledgments

The authors are thankful to the medical students at KSAU-HS who supported this study by completing the data collection instruments.

Ethical considerations

Ethical approval for this study was obtained from the IRB at King Abdullah Medical Research Center, the Ministry of National Guard Health Affairs, Riyadh, Saudi Arabia (Ref no.: #SP17/467/R), on January 07, 2018. The study was conducted in adherence with the guidelines of the Declaration of Helsinki, 2013, and all participants provided their electronic informed consent.

Peer review

This article was peer-reviewed by two independent and anonymous reviewers.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Colman A. A dictionary of psychology. Oxford: Oxford University Press; 2009.
2. Brackett MA, Rivers SE, Salovey P. Emotional intelligence: Implications for personal, social, academic, and workplace success. Soc Personal Psychol Compass 2011;5:88-1.
3. Ford ME, Smith PR. Thriving with social purpose: An integrative approach to the development of optimal human functioning. Educ Psychol 2007;42:153-71.
4. Berndt TJ. Friends' influence on students' adjustment to school. Educ Psychol 1999;34:15-28.
5. Thomas CL, Cassady JC, Heller ML. The influence of emotional intelligence, cognitive test anxiety, and coping strategies on undergraduate academic performance. Learn Individ Differ 2017;55:40-48.
6. Romanelli F, Cain J, Smith KM. Emotional intelligence as a predictor of academic and/or professional success. Am J Pharm Educ 2006;70:69.
7. 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.
8. Victoroff KZ, Boyatzis RE. What is the relationship between emotional intelligence and dental student clinical performance? J Dent Educ 2013;77:416-26.
9. Arora S, Ashrafian H, Davis R, Athanasiou T, Darzi A, Sevdalis N, *et al*. Emotional intelligence in medicine: A systematic review through the context of the ACGME competencies. Med Educ 2010;44:749-64.
10. Ranasinghe P, Wathurapatha WS, Mathangasinghe Y, Ponnamperuma G. Emotional intelligence, perceived stress and academic performance of Sri Lankan medical undergraduates. BMC Med Educ 2017;17:41.
11. Hasegawa Y, Ninomiya K, Fujii K, Sekimoto T. Emotional intelligence score and performance of dental undergraduates. Odontology 2016;104:397-401.
12. Kumar A, Puranik M, Sowmya K. Association between dental students' emotional intelligence and academic performance: A study at six dental colleges in India. J Dental Educ 2016;80:526-32.
13. Aithal AP, Kumar N, Gunasegeran P, Sundaram SM, Rong LZ, Prabhu SP, *et al*. A survey-based study of emotional intelligence as it relates to gender and academic performance of medical students. Educ Health (Abingdon) 2016;29:255-8.
14. Fernandez R, Salamonson Y, Griffiths R. Emotional intelligence as a predictor of academic performance in first-year accelerated graduate entry nursing students. J Clin Nurs 2012;21:3485-92.
15. Andonian L. Emotional intelligence, self-efficacy, and occupational therapy students' fieldwork performance. Occup Ther Health Care 2013;27:201-15.
16. Guseh S, Chen X, Johnson N. Can enriching emotional intelligence improve medical students' proactivity and adaptability during OB/GYN clerkships? Int J Med Educ 2015;6:208-12.
17. Perera HN. The role of trait emotional intelligence in academic performance: Theoretical overview and empirical update. J Psychol 2016;150:229-51.
18. Kuncel NR, Credé M, Thomas LL. The validity of self-reported grade point averages, class ranks, and test scores: A meta-analysis and review of the literature. Rev Educ Res 2005;75:63-82.
19. Al Shawwa L, Abulaban AA, Abulaban AA, Merdad A, Baghlaf S, Algethami A, *et al*. Factors potentially influencing academic performance among medical students. Adv Med Educ Pract 2015;6:65-75.
20. Duckwall JM, Arnold L, Hayes J. Approaches to learning by undergraduate students: A longitudinal study. Res High Educ 1991;32:1-13.

21. Ferguson E, James D, Madeley L. Factors associated with success in medical school: Systematic review of the literature. BMJ 2002;324:952-7.
22. Stenhouse R, Snowden A, Young J, Carver F, Carver H, Brown N, *et al*. Do emotional intelligence and previous caring experience influence student nurse performance? A comparative analysis. Nurse Educ Today 2016;43:1-9.
23. Holman MA, Porter SG, Pawlina W, Juskewitch JE, Lachman N. Does emotional intelligence change during medical school gross anatomy course? Correlations with students' performance and team cohesion. Anat Sci Educ 2016;9:143-9.
24. Humphrey-Murto S, Leddy JJ, Wood TJ, Puddester D, Moineau G. Does emotional intelligence at medical school admission predict future academic performance? Acad Med 2014;89:638-43.
25. Chew BH, Md Zain A, Hassan F. The relationship between the social management of emotional intelligence and academic performance among medical students. Psychol Health Med 2015;20:198-204.
26. Al-Hamdan Z, Oweidat I, Al-Faouri I, Codier E. Correlating emotional intelligence and job performance among Jordanian hospitals' registered nurses. Nurs Forum 2017;52:12-20.
27. Schutte NS, Malouff JM, Bhullar N. The assessing emotions scale. In: Stough C, Saklofske D, Parker J, editors. The Assessment of Emotional Intelligence. New York: Springer Publishing; 2009. p. 119-35.
28. Naeem N, Muijtjens A. Validity and reliability of bilingual English-Arabic version of schutte self report emotional intelligence scale in an undergraduate Arab medical student sample. Med Teach 2015;37 Suppl 1:S20-6.
29. Prevatt F, Li H, Welles T, Dreher FD, Yelland S, Lee J. The academic success inventory for college students: Scale development and practical implications for use with students. J Coll Adm 2011;211:26-31.
30. Stratton TD, Saunders JA, Elam CL. Changes in medical student's emotional intelligence: An exploratory study. Teach Learn Med 2008;20:279-84.
31. Gondal UH, Hussain T. A comparative study of intelligence quotient and emotional intelligence: Effect on employees' performance. Asian J Bus Manag 2012;5:153-62.
32. Ahmad J, Anwar M, Anwar A, Bareech K. A co-relational study of intelligence and academic achievement of students from government schools of Peshawar district. PUTAJ-Humanit Soc Sci 2014;21:107-15.
33. Lam LT, Kirby SL. Is emotional intelligence an advantage? An exploration of the impact of emotional and general intelligence on individual performance. J Soc Psychol 2002;142:133-43.
34. Imran N, Awais Aftab M, Haider II, Farhat A. Educating tomorrow's doctors: A cross sectional survey of emotional intelligence and empathy in medical students of Lahore. Pak J Med Sci 2013;29:710-4.
35. Preeti B. Role of emotional intelligence for academic achievement for students. Res J Educ Sci 2013;1:8-12.
36. Valiente C, Swanson J, Eisenberg N. Linking students' emotions and academic achievement: When and why emotions matter. Child Dev Perspect 2012;6:129-35.
37. Wagner PJ, Moseley GC, Grant MM, Gore JR, Owens C. Physicians' emotional intelligence and patient satisfaction. Fam Med 2002;34:750-4.
38. Austin EJ, Evans P, Goldwater R, Potter V. A preliminary study of emotional intelligence, empathy and exam performance in first year medical students. Personal Individ Differ 2005;39:1395-405.
39. Wijekoon CN, Amaratunge H, de Silva Y, Senanayake S, Jayawardane P, Senarath U, *et al*. Emotional intelligence and academic performance of medical undergraduates: A cross-sectional study in a selected university in Sri Lanka. BMC Med Educ 2017;17:176.
40. Austin EJ, Evans P, Magnus B, O'Hanlon K. A preliminary study of empathy, emotional intelligence and examination performance in MBChB students. Med Educ 2007;41:684-89.
41. Martin SC, Arnold RM, Parker RM. Gender and medical socialization. J Health Soc Behav 1988;29:333-43.
42. Freshman B, Rubino L. Emotional intelligence: A core competency for health care administrators. Health Care Manag (Frederick) 2002;20:1-9.