



Original Article

Association Between Emotional Intelligence and Clinical Competence Among Medical Students: A Cross-Sectional Investigation

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Abstract

Introduction: In contemporary healthcare environments, clinical competence and emotional intelligence (EI) are recognized as indispensable professional attributes, each exerting a marked influence on the quality of care and patient satisfaction. Accordingly, the present study aimed to investigate the association between EI and clinical competence among medical students at Fasa University of Medical Sciences.

Methods: This cross-sectional study was conducted among 152 medical interns at Fasa University of Medical Sciences. Data were collected using a structured three-part questionnaire consisting of a demographic form, the Bradberry-Greaves EI Questionnaire (Bradberry -Greaves 2009), and the Leo Clinical Competence Assessment Questionnaire (2007). Finally, the data were analyzed using Pearson's correlation coefficient, the independent samples t-test, analysis of variance, and the chi-square test.

Results: The mean age of the participants was 25.2 ± 3.46 years. In addition, the mean scores for clinical competence and EI were 134.7 ± 28.2 and 106.4 ± 13.9 , respectively, indicating a moderate level of clinical competence and a high level of EI. Clinical competence was significantly associated with marital status and students' interest in their field of study ($P=0.03$). Similarly, EI was substantially related to marital status ($P=0.01$) and academic interest ($P=0.02$).

Conclusion: Medical students demonstrated moderate clinical competence alongside relatively high EI, underscoring the need for educational planners and healthcare policymakers to develop targeted strategies to sustain and enhance students' engagement with their chosen field.

Keywords: Clinical Competence, Emotional Intelligence, Student, Medical



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Introduction

Considering that the ultimate objective of the medical education system is to enhance community health, the efforts of educational stakeholders and service providers should be directed toward meeting societal needs (1). Accordingly, educational planning, its implementation, and university educational services must be aligned with community requirements so that students, equipped with the necessary knowledge and skills, can effectively contribute to society and help address its needs and challenges (2). Clinical education constitutes a central pillar of health professions training, providing students

with the theoretical foundations, practical abilities, clinical reasoning skills, and ethical orientation required for independent professional practice (3). Among the expected outcomes of such training, clinical competence is widely regarded as one of the most direct indicators of quality and effectiveness. Moreover, clinical education is an integral component of skill development in healthcare students, enabling them to acquire the competencies required for independent learning, appropriate decision-making, and ethical responsibility in relation to patient care during healthcare delivery (1). Additionally, clinical competence serves as the principal benchmark



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for evaluating the effectiveness of medical education. Likewise, it encompasses a broad combination of knowledge, skills, attitudes, and practical abilities that healthcare professionals, particularly nurses and physicians, require to provide safe, effective, and evidence-based care. Furthermore, this concept includes the ability to apply knowledge, communicate effectively, maintain interpersonal relationships, think critically, demonstrate technical proficiency, manage complex situations, and adhere to the principles of professional ethics. Beyond medical knowledge for patient care and treatment, medical students must also possess clinical skills and be able to integrate scientific and practical learning. Indeed, the development of clinical reasoning plays a significant role in strengthening students' competencies in clinical education (2, 3).

A range of factors have increased the importance of clinical competence in health-related disciplines, including the transformation of healthcare systems, the demand for safe and cost-effective services, increased public awareness of health issues, rising expectations for high-quality care, and the growing need for skilled healthcare professionals (4). In addition, clinical training experiences, particularly those acquired during clerkship and internship, are central to the development of these competencies in medical students. Therefore, acquiring clinical competence during the internship and clerkship periods, which constitute two major components of clinical education, is essential and receives particular emphasis in educational planning (2). According to a study conducted in 10 European countries, clinical competence levels ranged from 50% to 60.1% (5). In Iran, Aghabary and Khedmatzare reported that more than half of the nursing students demonstrated a moderate level of clinical competence (6).

Experience, the learning environment, utilization of available opportunities, motivation, theoretical knowledge, and personal characteristics, such as emotional intelligence (EI), are among the factors that influence clinical competence (7). EI is generally defined as the capacity to perceive, understand, regulate, and effectively use emotions in oneself and others. It is critical for the development and integration of professional identity and competence, which are primarily shaped through effective communication (8). Further, EI is a psychosocial capability that affects academic achievement and workplace dynamics (9). It encompasses an individual's capacity to understand and manage personal and others' emotions and use them in ways that facilitate thinking. In addition, EI is directly associated with appropriate behavior, positive social interaction, and environmental adaptation and plays a crucial role in clinical settings (10, 11). This capability can be developed and strengthened through training and may substantially influence students' learning processes, ethical judgment, critical thinking, application of evidence and knowledge in practice, quality of healthcare delivery, and patient outcomes (12).

Numerous studies have shown that individuals with

higher EI are better able to identify effective coping strategies and manage stressors in the clinical environment. This ability not only facilitates communication but also enhances clinical performance and contributes to improved patient outcomes (13). Nevertheless, some studies have reported a decline in EI among medical students over the course of their education (14,15). Accordingly, clarifying the relationship between EI and clinical competence may provide a basis for designing appropriate educational interventions in order to strengthen these domains. Given the importance of clinical competence in delivering safe and effective services, together with the pivotal role of EI in professional interactions and clinical performance, examining the relationship between these two variables is essential.

To the best of our knowledge, this relationship has primarily been investigated among nursing students (6, 10). Nonetheless, it has received less attention among clinical medical students, particularly in studies conducted by Iranian researchers, despite their exposure to workplace pressures and high-stress hospital environments (11). It is noteworthy that medical students as future healthcare providers have a central role. Given the substantial proportion of clinical education that occurs during internship and clerkship and the importance of cultural competence in enhancing clinical performance, the present study aims to examine the relationship between clinical competence and EI among medical students at Fasa University of Medical Sciences in southern Iran in 2025.

Methods

Study Design

This descriptive analytical cross-sectional study was conducted among 152 medical interns at Fasa University of Medical Sciences. A census sampling strategy was used, implying that all eligible students were included based on predefined inclusion criteria, including formal enrollment in the internship stage, willingness to participate, and completion of the questionnaires. However, students were excluded if they declined participation, returned incomplete questionnaires, or were visiting students enrolled on a temporary basis.

Further, the study population comprised all medical students in the internship phase of training. The required sample size for assessing the association between clinical competence and EI was estimated at a 95% confidence level and 90% statistical power, assuming a correlation coefficient of 0.20 and an anticipated attrition rate of 10%. Accordingly, the final sample size was set at 152 participants.

$$n = \left(\frac{z_{1-\frac{\alpha}{2}} + z_{1-\beta}}{\frac{1}{2} \ln \frac{1+r}{1-r}} \right)^2 + 3$$

Participants were assured that all questionnaires would be completed anonymously, that their responses would remain strictly confidential, and that the data would not affect any formal evaluation of their professional performance or competence. Moreover, after the study objectives and procedures had been thoroughly explained, students were asked to provide candid and accurate responses to all items. The clinical competence and EI instruments were then administered in self-report format.

Data Collection Instruments

Data were collected using a demographic characteristics questionnaire, the Bradberry-Greaves EI Questionnaire (2009), and the Leo Clinical Competence Assessment Questionnaire (Bradberry -Greaves 2009). All three instruments were completed by the participating medical interns in self-report form. The demographic questionnaire gathered information on age, gender, marital status, place of residence, dormitory accommodation, and interest in the field of study.

In this study, interest was conceptualized as a genuine motivational tendency that leads a person to prefer one option over another in decision-making. To assess students' interest in their academic discipline, they were asked, "Are you interested in your field of study?" Responses were then recorded dichotomously as "Yes" or "No".

Bradberry-Greaves Emotional Intelligence Questionnaire

Originally developed by Bradberry and Greaves (2009), the Bradberry-Greaves EI Questionnaire consists of 28 items and assesses overall EI, self-awareness, self-management, social awareness, and relationship management. Items are rated on a six-point Likert-type scale ranging from 1 to 6. The total EI score is obtained by summing all item scores. Scores above 80 indicate high EI, whereas scores below 60 represent low EI. The highest possible score is 168 (16).

The Persian version of the questionnaire was translated and validated by Ganji et al, who reported a reliability coefficient of 0.84, indicating acceptable internal consistency (17).

Leo Clinical Competence Assessment Questionnaire

The Leo Clinical Competence Assessment Questionnaire measures seven domains of clinical competence: critical thinking (8–32), coaching and teaching (6–24), professional development (6–24), ethical and legal practice (8–32), interpersonal relationships (6–24), leadership (9–36), and clinical care (9–36) (18). Higher scores in each domain reflect greater competence. In addition, total scores between 165 and 220 and between 110 and 165 denote high and moderate clinical competence, respectively, and scores below 110 imply low competence.

This instrument was translated and psychometrically evaluated by Ghasemi et al. Content validity assessment yielded a content validity index of 0.94 for the overall instrument, while the content validity index for individual

items exceeded 0.83. Further, confirmatory factor analysis supported the original seven-factor structure of the questionnaire. The instrument also demonstrated strong psychometric properties, with an item-total correlation coefficient of 0.94 and an overall Cronbach's alpha of 0.97. Furthermore, Cronbach's alpha coefficients for the individual domains ranged from 0.68 to 0.78, indicating acceptable reliability and validity in the Iranian nursing population. Moreover, the overall reliability of the questionnaire was confirmed by a Cronbach's alpha coefficient of 0.83 (19).

Statistical Analysis

All statistical analyses were conducted using SPSS, version 25. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarize the data. Additionally, inferential analyses were performed using Pearson's correlation coefficient, the independent-samples t test, and multiple linear regression analysis. Statistical significance was defined as $P < 0.05$. Before inferential testing, the normality of the data distribution was assessed and confirmed using the Kolmogorov-Smirnov test.

Results

The medical students had a mean age of 25.2 ± 3.46 years and a mean grade point average of 16.1 ± 1.1 . In addition, most participants were female (57.2%), unmarried (72.3%), residents of university dormitories (78.9%), and non-native residents (70.3%). A detailed summary of the participants' demographic characteristics is provided in Table 1.

The mean clinical competence score was 134.7 ± 28.2 , which corresponded to an overall moderate level of competence. Among the individual competency domains, clinical care had the highest mean score (25.5 ± 5.3), whereas professional development had the lowest mean score (13.4 ± 3.5). Further, the mean EI score was 106.4 ± 13.9 , indicating a high level of EI among the participants. Within the EI dimensions, self-awareness and social awareness had the highest (23.6 ± 3.8) and lowest (20.2 ± 3.6) mean scores, respectively (Table 2).

The results of the independent-samples t-test (Table 3) showed statistically significant differences in clinical competence according to marital status and students' level of interest in their field of study ($P = 0.03$). Likewise, EI was significantly associated with marital status ($P = 0.01$) and interest in the field of study ($P = 0.02$).

Similarly, Pearson's correlation analysis (Table 4) revealed a statistically significant positive relationship between clinical competence and EI ($r = 0.36$, $P = 0.001$). In addition, age was positively correlated with both clinical competence ($r = 0.24$, $P = 0.02$) and EI ($r = 0.34$, $P = 0.01$).

Based on the multiple linear regression analysis, EI ($\beta = 0.27$, $P = 0.029$) and age ($\beta = 0.19$, $P = 0.042$) were significant predictors of clinical competence and its related dimensions. In general, the variables entered into

Table 1. Demographic Characteristics of Study Participants (N = 152)

Variable	Terms	Frequency (n)	Percentage (%)
Gender	Female	87	57.23
	Male	68	44.73
Marital status	Single	110	72.36
	Married	42	27.63
Place of residence	Dormitory	120	78.94
	Non-dormitory	32	21.06
Residency status	Native	45	29.61
	Non-native	107	70.39
Interest in field of study	Yes	130	85.52
	No	22	14.48

Table 2. Distribution of Clinical Competence and Emotional Intelligence Scores Among Study Participants

Variable	Frequency (n)	Clinical Competence		
		Minimum	Maximum	Mean ± SD
Clinical competence	152	78	192	134.7 ± 28.2
Clinical care	152	11	39	25.5 ± 5.3
Leadership	152	9	34	22.2 ± 5.7
Interpersonal communication	152	11	28	19.2 ± 4.3
Legal and ethical performance	152	8	24	17.9 ± 4.8
Professional development	152	6	22	13.4 ± 3.5
Guidance	152	6	27	16.6 ± 4.7
Critical thinking	152	11	31	19.1 ± 4.9
Variable	Frequency (n)	Emotional Intelligence		
		Minimum	Maximum	Mean ± SD
Emotional intelligence	152	54	133	106.4 ± 13.9
Self-awareness	152	14	33	23.6 ± 3.8
Self-management	152	17	41	31.3 ± 4.8
Social awareness	152	10	29	20.2 ± 3.6
Relationship management	152	13	43	31.3 ± 5.6

Note. SD: Standard deviation.

the regression model accounted for 26% of the variance in clinical competence (Table 5).

Discussion

The present investigation examined the association between EI and clinical competence among medical interns at Fasa University of Medical Sciences. Overall, the findings indicated that the participants had a moderate level of clinical competence and a high level of EI. Among the clinical competence domains, clinical care obtained the highest mean score, whereas professional development had the lowest score. Moreover, clinical competence and EI were substantially associated with marital status and interest in the field of study. Most importantly, EI was positively correlated with clinical competence and emerged as a significant predictor of

Table 3. Distribution of Clinical Competence and Emotional Intelligence Scores by Demographic Characteristics

Variable	Group	Clinical Competence Mean ± SD	P-Value*	Emotional Intelligence Mean ± SD	P-Value*
Gender	Female	131.7 ± 31.1	0.33	107.4 ± 10.2	0.38
	Male	137.2 ± 9.05		105.07 ± 17.8	
Marital status	Single	138.4 ± 26.5	0.03	104.9 ± 13.4	0.01
	Married	113.2 ± 29.5		115.6 ± 13.8	
Residency status	Native	134.3 ± 25.3	0.91	108.7 ± 12.6	0.11
	Non-native	135.1 ± 31.3		104.1 ± 14.9	
Place of residence	Dormitory	137.4 ± 26.1	0.11	105.1 ± 13.1	0.17
	Non-dormitory	127.8 ± 32.9		110.1 ± 15.6	
Interest in field of study	Yes	148.04 ± 32.9	0.03	108.8 ± 12.1	0.02
	No	130.7 ± 25.5		98.2 ± 16.8	

Note. *Independent sample t-test; SD: Standard deviation.

Table 4. Correlation Analysis of Age, GPA, Emotional Intelligence, Clinical Competence

Variable		Emotional Intelligence	Clinical Competence
Emotional intelligence	Pearson correlation	1	0.36
	Sig. (2-tailed)	—	0.001
Clinical competence	Pearson correlation	0.36	1
	Sig. (2-tailed)	0.001	—
Age	Pearson Correlation	0.34	0.24
	Sig. (2-tailed)	0.01	0.02
GPA	Pearson correlation	-0.07	0.01
	Sig. (2-tailed)	0.51	0.87

Note. GPA: Grade point average; Sig.: Level of significance.

Table 5. Multiple Linear Regression Analysis Examining the Relationship Between Predictor Variables and Clinical Competence

Variable	B	SE	Beta	t	P-Value*
Constant	67.14	15.1	—	2.63	0.001
Emotional intelligence	0.22	0.09	0.27	-2.29	0.029
Age	0.42	0.30	0.19	0.28	0.042
Marital status	-0.51	1.52	-0.01	-1.72	0.08
Dormitory residence	-3.15	1.54	-0.01	-0.13	0.89
Grade point average	-1.53	0.69	-0.01	-0.14	0.79
R=0.45, R-square=0.26, f=3.35, P<0.001					

Note. SE: Standard error of the mean.

competence in this cohort.

According to our findings, the students demonstrated a moderate level of clinical competence, which is consistent with previous reports among nursing students in Tabriz and nurses working in educational and healthcare settings in Ardabil (6, 20). Similarly, a systematic review and meta-analysis of Iranian nurses reported an overall acceptable level of clinical competence, with clinical care and professional development receiving the highest and lowest scores, respectively (21). Although the pattern across competency domains closely resembles that observed in the present study, the overall competence level reported in that review was higher than that found

among the present participants. This discrepancy may be attributable to differences in professional experience, because practicing nurses generally have greater clinical exposure, more autonomy in clinical judgment, and broader responsibilities than medical interns. In addition, differences in the study setting, participant characteristics, and measurement instruments may have contributed to the inconsistencies observed across studies.

By contrast, Imani et al and Zeleníková et al found favorable levels of clinical competence among anesthesiology and operating room students in Iran and among final-year nursing students in the Czech Republic, respectively (7, 22). In another study, Amsalu et al concluded that only about one-quarter of Ethiopian nursing students had an adequate level of clinical competence (23). The substantial variation across studies suggests that competence development may be strongly influenced by factors such as curriculum structure, the quality of clinical supervision, workload, and assessment practices. Furthermore, response bias should also be considered because several investigations, including the present one, relied on self-report measures. Moreover, students may unintentionally underreport or overreport their actual competence, thereby affecting the precision of the findings.

The observed association between clinical competence and students' interest in their field of study is theoretically well founded. Students who are genuinely interested in their discipline are typically more intrinsically motivated, more actively engaged in learning, and more persistent in developing professional skills. In line with this interpretation, Mirlashari et al reported a positive association between interest in the nursing profession and clinical competence among nurses (24). Likewise, marital status was significantly associated with clinical competence in the present study. Similar findings have been reported in several earlier studies (25, 26, 27), suggesting that married individuals may have greater emotional maturity, a stronger sense of responsibility, and more effective time management skills. Nevertheless, other studies have failed to identify such an association and have instead emphasized contextual and environmental influences, including the quality of the clinical learning environment, support from healthcare staff, and students' confidence in their own abilities (28, 29). Accordingly, the relationship between marital status and clinical competence should be cautiously interpreted and regarded more as a possible confounding factor than as a direct causal determinant.

With respect to EI, the participants demonstrated a high overall level, with self-awareness and social awareness representing the strongest and weakest dimensions, respectively. Comparable patterns have been found among nursing interns in China and anesthesiology students in Iran (7, 12). Likewise, Masoudi and Alavi identified self-awareness as the most prominent component of EI among nurses (13). In contrast, some studies conducted in Iran reported only moderate EI among nursing students (2, 6). These differences may reflect variations in the cultural

context, educational setting, personality characteristics, and exposure to stressful clinical experiences. In addition, it is plausible that sustained contact with patients, together with the gradual assumption of clinical responsibilities during internship, strengthens self-awareness and emotional regulation in medical students.

The significant association between EI and marital status observed in the present study conforms to the findings of Bagheri et al and Abdul Rasheed and Johnson, demonstrating higher EI scores among married nurses (30, 31). Similarly, Madahi et al found that married university students achieved higher scores in several dimensions of EI (32). Greater life experience and broader interpersonal engagement may facilitate the development of empathy, emotional insight, and self-regulation. However, Ebrahimi et al observed no significant relationship between marital status and EI among hospital nursing staff (33). These contradictory findings may be attributable to differences in demographic composition, age distribution, professional background, and occupational setting.

One of the most important findings of the present study was the significant positive association between EI and clinical competence ($r=0.36$, $P=0.001$), suggesting that students with higher EI are more likely to demonstrate stronger clinical competence. EI may also enhance clinical performance by supporting stress regulation, facilitating effective communication, promoting empathy, improving teamwork, and enabling flexible, adaptive decision-making in complex clinical situations (12). Consistent with this result, Rigney and Baernholdt reported that nursing students with higher EI had better clinical performance and more advanced problem-solving abilities (34). Similar associations were found by Aghabarary and Khedmatizare, Park et al., and Imani et al (6, 10, 35). Contrarily, Jones did not find a significant association between EI and clinical performance among undergraduate nursing students in California (36). Such inconsistencies across studies may be explained by differences in cultural context, measurement instruments, educational settings, and participant characteristics.

Overall, our findings highlight EI as a potentially important determinant in the development and strengthening of clinical competence among medical students. Given the increasing complexity of healthcare delivery and the growing emphasis on patient-centered care, educational programs designed to enhance EI may contribute not only to stronger interpersonal and professional skills, but also to higher clinical competence among future healthcare professionals.

Additional analyses using multiple linear regression revealed that both EI and age were significant predictors of clinical competence, together explaining 26% of the variance in competence scores. Although this proportion indicates that clinical competence is shaped by a broader set of influences, it points to the substantial contribution of EI to clinical performance. In the present study, self-awareness obtained the highest score among the EI dimensions, which may be attributable to its role in

reflective practice, critical self-appraisal, and adaptive learning processes, all of which facilitate professional growth and competence development (37). Likewise, age may serve as a surrogate for accumulated clinical exposure, as well as greater emotional and psychological maturity. Comparable findings were reported by Najafi et al, demonstrating that both EI and age are significant predictors of clinical competence among nurses (4). Moreover, several studies have documented age-related differences in clinical competence (26, 38, 39). By contrast, Bahreini et al found no significant relationship between age and clinical competence (40), highlighting the need for longitudinal research that can more precisely clarify developmental trajectories and temporal associations among these variables.

Overall, the findings of this study suggest that EI should not be viewed merely as a supplementary interpersonal attribute. Rather, it appears to constitute an important element in the emergence, refinement, and strengthening of clinical competence. Considering that EI can be enhanced through targeted educational interventions, its systematic incorporation into medical education curricula may represent an effective strategy for promoting students' clinical development and improving their readiness for future professional practice.

Limitations of the Study

Several limitations should be acknowledged when interpreting the findings of this study. First, the cross-sectional design did not permit any inference regarding causal relationships among the variables examined in this study. Accordingly, although significant associations were identified, no conclusion can be drawn about the directionality or causality of these relationships. Moreover, the sample was restricted to medical students and included no learners from other academic disciplines or other stages of professional training. Consequently, the generalizability of the findings beyond the study population may be limited. Therefore, future studies should include a broader range of potentially influential variables and adopt prospective or longitudinal designs in order to provide stronger evidence concerning causal pathways and further clarify the relationships among the constructs under investigation.

Implications for Medical Education

The present findings offer meaningful support for the role of EI as a predictor of clinical competence among medical students during internship training. These results demonstrate that medical education programs would benefit from integrating structured efforts to foster EI within their curricula. Strengthening students' emotional competencies throughout their academic training may, in turn, contribute to more robust clinical competence and greater professional readiness.

Several educational strategies may be especially effective in cultivating EI in medical education. Simulation-based learning, experiential clinical training, and team-based

learning provide valuable opportunities for students to recognize, interpret, and regulate the emotional factors that shape clinical performance. Through active participation in these learning experiences, students may develop emotional competencies that support more effective professional functioning in healthcare settings. In addition, reflective practice has increasingly been recognized as a valuable pedagogical strategy for enhancing EI and should therefore be considered an integral element of contemporary medical curricula. Further, EI can be taught to medical students without major curricular reform and incorporated as a basic component of the psychiatric and mental health medicine course. In clinical education, integrating critical thinking and EI may improve medical students' clinical competence.

Conclusion

Our findings indicated that medical students had moderate clinical competence and high EI. Furthermore, EI was positively associated with clinical competence and emerged as a significant predictor of competence among the participants. In light of these findings, educational administrators and policymakers are encouraged to design and implement interventions that both preserve and strengthen students' interest in their chosen field of study while simultaneously promoting the development of EI. Such initiatives may help enhance clinical competence and better prepare future physicians for the complex demands of professional practice.

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Authors' Contribution

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Availability of Data and Materials

The datasets generated and analyzed during the current study are available upon reasonable request from the corresponding author.

Competing Interests

The authors declare that they have no competing interests related to this study.

Consent to Publish

Not applicable.

Ethical Approval

Written informed consent was obtained from all participants before enrollment in the study. In addition, the research was conducted in accordance with the ethical principles outlined in the revised Declaration of Helsinki for research involving human participants. Moreover, participants were assured that all the provided information would remain anonymous and confidential. Finally, ethical approval for the study was granted by the Institutional Research Ethics Committee of Fasa University of Medical Sciences, Fasa, Iran (ethical code IR.FUMS.REC.1403.079).

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