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Original Article

Comparison of Emotional Intelligence Between Medical and Nursing Students During Clinical Training at Bushehr University of Medical Sciences

Azadeh Azemian [1], Somieh Ebneroomi [2], Nazanin Jafari [3], Mojghan Mokhtari Zanjani [4*]

[1] Department of Medical Education, Education Development Center, School of Medicine, Bushehr University of Medical Sciences, Bushehr, Iran
[2] Department of Medical Education, Education Development Center, Bushehr University of Medical Sciences, Bushehr, Iran
[3] Dental School, Bushehr University of Medical Sciences, Bushehr, Iran
[4] Department of Midwifery, School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran

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***Corresponding author:**
Mojghan Mokhtari Zanjani
Department of Midwifery, School of Nursing and Midwifery, Zanjan University of Medical Sciences, Zanjan, Iran.
Email:
mokhtari@zums.ac.ir

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Abstract

Background: Emotional intelligence (EI) plays a pivotal role in clinical education by enhancing learners' adaptation to the clinical setting, improving communication and interpersonal interactions, and ultimately contributing to successful learning outcomes in clinical practice.
Objectives: The objective of this study was to compare EI levels between medical and nursing students in the clinical training phase of their education.
Methods: This descriptive cross-sectional study was conducted in the first semester of the 2023–2024 academic year at Bushehr University of Medical Sciences. The study population included 87 students undergoing clinical training, comprising 59 medical students and 28 nursing students, who were selected by census sampling. Data were collected using the Crowne EI Questionnaire, a 25-item instrument that assesses five domains. Items were scored on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total score of the questionnaire ranges from 25 to 125. Data analysis was performed using SPSS version 20.
Results: The mean EI score was 87.9 (SD = 14.57) among medical students and 81.02 (SD = 8.36) among nursing students. A statistically significant difference was found in overall EI between the two groups ($t = 2.18$, $p = 0.03$, $d = 0.53$). Moreover, demographic variables showed no significant association with EI scores in either group.
Conclusion: Although both groups showed relatively good EI levels, targeted interventions are needed to maintain and enhance EI. These findings may inform curriculum revisions and support the integration of structured EI training into undergraduate programs.

Implications for Nursing and Midwifery Preventive Care

- Integrate communication, empathy, teamwork, and stress management into clinical training to promote emotional competence and prevent stress-related difficulties.
- Assess EI periodically to identify at-risk students early and provide preventive educational support.

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Introduction

Intelligence is considered one of the fundamental aspects of how individuals adapt to their environment and one of the most critical components of individual differences [1]. Although decades of research have focused on cognitive intelligence as the primary predictor of personal success, cognitive intelligence is an important predictor of academic and professional achievement, it does not fully explain individual success, and non-cognitive factors such as emotional intelligence (EI) may also contribute substantially to personal, educational, and occupational outcomes [2].

Among these, EI stands out as one of the most influential non-cognitive constructs, playing a decisive role in personal, occupational, and social performance [3]. EI was first introduced by Salovey and Mayer (1990) within an ability-based model framework, defined as "the capacity to reason about emotions to enhance thinking," which encompasses four dimensions: perceiving, facilitating, understanding, and regulating emotions [4]. Subsequently, broader conceptualizations of EI emerged. Mixed models conceptualize EI as a combination of emotional, personal, and social competencies that influence an individual's ability to cope effectively with environmental demands and interpersonal interactions. These models encompass dimensions such as self-awareness, emotion management, self-motivation, empathy, and social skills, emphasizing the application of emotional competencies in real-world personal and professional contexts [5-7].

Among the most influential mixed-model approaches are Goleman's competency model and Bar-On's model of emotional-social intelligence. Consistent with this perspective, the Crowne EI Questionnaire was developed based on the mixed-model conceptualization of EI as its operational framework.

The questionnaire assesses dimensions including self-awareness, emotion management, self-motivation, empathy, and social skills [8]. Accordingly, the present study adopts a mixed-model conceptualization of EI as its operational framework.

In the realm of healthcare professions, particularly in nursing and medicine, EI has been associated with notably significant clinical outcomes.

A substantial body of research evidence indicates that higher levels of EI are positively and meaningfully related to more effective communication skills, greater empathy, resilience in emotionally intense situations, enhanced teamwork efficacy, and optimal stress management within clinical environments [9]. EI assists nurses in enhancing their resilience and reducing burnout by improving communication skills, stress management, and empathy. Consequently, it positively influences primary healthcare delivery and the implementation of preventive services and programs [10, 11].

For instance, Riaz and colleagues (2025) reported a strong correlation (r = 0.961) between EI and communication skills among nursing students [12]. Furthermore, Kosydar-Boecenk and colleagues (2025) have demonstrated that EI plays a determining role in preparing healthcare professionals for the management and delivery of unfavorable news [13]. At the domestic level, a study by Amini et al., which aimed to examine the relationship between communication abilities and EI among medical personnel working in outpatient clinics in Shiraz, with the participation of 108 such personnel, revealed that higher levels of EI led to improved treatment outcomes and enhanced quality of patient rapport [14]. In addition, studies by Tasdighi et al. and Mohammadi et al. have identified a significant relationship between EI and academic achievement among medical and nursing students [15, 16].

Many studies confirm a positive and significant relationship between EI and key outcomes, including empathy, clinical performance, quality of care, and resilience, among nursing and medical students. For instance, Maity et al. demonstrated that higher EI contributes to improved doctor-patient relationships, reduced burnout, enhanced clinical decision-making, and ultimately greater patient satisfaction and more compassionate healthcare delivery [17].

Additionally, a meta-analysis by Kawashima et al. (2025) evaluated the effectiveness of EI training on nurses and nursing students. The results showed that EI training significantly improved participants' EI compared to the control group. It also had a significant effect on reducing stress and produced a significant positive effect on communication skills. However, the training had no significant effect on resilience [18].

Growing evidence indicates that higher education systems in health sciences in many countries, including Iran, continue to rely on memory-based strategies and information accumulation, while failing to adequately nurture fundamental components such as self-awareness, self-management, empathy, and impulse control, which are elements that constitute the core of EI [15]. On the other hand, given the critical role of communication skills, patient empathy, resilience in high-stress and emotionally charged situations, teamwork and collaborative capacity, as well as stress management and control within clinical environments, and considering the influence of EI on individual success across occupational, social, and emotional domains, it can be argued that systematic attention to EI provides a foundation for more effective adaptation and optimal individual performance. This underscores the necessity of assessing the current state of EI as an initial step in designing any educational intervention.

Despite the growing body of evidence highlighting the critical role of EI in healthcare education and clinical practice, limited research has directly compared the level and development of EI between medical and nursing students within the same educational and cultural context. Most previous studies in Iran have focused on nursing or medical students separately, with few examining both groups simultaneously during their clinical training. This is particularly evident in regional settings such as Bushehr University of Medical Sciences. Given the distinct professional roles, responsibilities, and training pathways of these two disciplines, it remains unclear whether EI competencies, such as empathy, self-awareness, and stress management, develop similarly or differently across the two groups. Addressing this gap is essential for designing tailored educational interventions and curricula that effectively enhance emotional and interpersonal competencies among future healthcare professionals.

Objectives

The objective of this study was to compare the levels of EI between medical and nursing students undergoing clinical training at Bushehr University of Medical Sciences.

Methods

Study Design

The present study was descriptive-cross-sectional in design.

Participants and Sampling

The study population comprised all clinical-level medical and nursing students enrolled during the 2023–2024 academic year (corresponding to the first semester of the 1402–1403 academic year in the Iranian calendar). Data were collected from August 23 to October 23, 2023.

Sampling was conducted using a census method. Nursing students were studying in the sixth and seventh semesters, and medical students (pre-intern and intern) were studying in the fifth and sixth years (pre-intern and intern). The data collection took place at the Persian Gulf Teaching Hospital and Nursing Faculty. Out of 168 nursing and medical students in the clinical stage, 87 returned the questionnaire (response rate 52%).

In the Iranian educational system, intern students were defined as nursing students enrolled in semesters 7–8 and medical students enrolled in semesters 12–14, who were undergoing clinical internship training. Pre-intern students were defined as nursing students enrolled in semesters 2–6 and medical students enrolled in semesters 8–11, who were completing clinical training before entering the internship phase.

The inclusion criterion for the study was that nursing students were studying in the sixth and seventh semesters, and medical students (pre-intern and intern) were studying in the Fifth and sixth years (pre-intern and intern). The exclusion criteria were

defined as incomplete completion of the questionnaire or unwillingness to continue participation during the study.

Measurement Instruments (Validity & Reliability)

The Crowne EI Questionnaire has previously been used in domestic studies, and its face and content validity have been confirmed by expert opinion. In the study by Abdali et al. (2019), the instrument's reliability was reported as 0.83 using Cronbach's alpha, and the subscales' reliability fell within an acceptable range [19]. In the present study, reliability was assessed using Cronbach's alpha; the overall alpha of the questionnaire was 0.83, indicating acceptable reliability.

Data Collection Procedure

The data collection instrument was the Crowne EI Questionnaire (2007), which consists of 25 items across five dimensions, comprising self-awareness, emotion management, empathy, social skills, and motivation, along with a section on demographic characteristics. Scoring was based on a five-point Likert scale ranging from "strongly agree" (5) to "strongly disagree" (1). The score range extended from a minimum of 25 to a maximum of 125. Accordingly, a total score of 100 or higher indicates high EI, a score between 75 and 100 reflects good EI capacity, and a score below 75 signifies that the individual falls below the average level of EI [20].

Statistical Analysis

After the questionnaires were completed, the data were coded and analyzed using SPSS version 20. In this study, Statistical analyses were performed using SPSS software. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the data. The normality of quantitative variables was assessed using the Shapiro–Wilk test, together with visual inspection of histograms and Q–Q plots. Independent-samples t tests were used to compare EI scores and their dimensions between medical and nursing students. The Mann–Whitney U test was applied to compare EI scores across gender and academic levels when the assumption of normality was not satisfied. Pearson's correlation coefficient was used to examine the relationship between age and EI. A p-value less than .05 was considered statistically significant.

Result

In the present study, out of 168 eligible students, 87 participants completed the questionnaire in full, yielding a response rate of 52%. The Sociodemographic characteristics of the participants are summarized in Table 1.

The results showed that the mean EI score of medical students was 87.90 (SD = 14.57), which was evaluated as "good" (above the mean of 75). Furthermore, the mean EI score of nursing students was 81.02 (SD = 8.36), which also fell within the "good" range. The results of the independent samples t-test indicated statistically significant differences between medical and nursing students in the "Emotion Management" domain ($p = 0.048$, *Cohen's d* = 0.46) and in total EI ($p = 0.032$, *Cohen's d* = 0.53). No significant differences were observed in other domains. For the self-awareness domain, Welch's t-test was used because the assumption of homogeneity of variances was violated. Therefore, the degree of freedom was estimated using the Welch–Satterthwaite approximation, resulting in a fractional df value (df = 77.76) [Table 2].

In addition, no significant correlation was found between age and EI among medical students (Spearman's ρ = -0.124, 95% CI [-0.383, 0.167], $p = 0.347$) or nursing students (Spearman's ρ = -0.121, 95% CI [-0.466, 0.272], $p = 0.530$). Similarly, in the pooled sample, there was no significant difference in EI scores between male and female students (U = 772.00, Z = -0.49, $p = 0.623$). Because the assumption of normality was not met, the Mann–Whitney U test was used to compare EI scores across educational levels. The results indicated a statistically significant difference between pre-intern and intern students (U = 575.00, Z = -2.89, $p = 0.004$). pre-intern students demonstrated higher EI scores (mean rank = 50.27) than intern students (mean rank = 34.54) [Table 3].

Table1. Demographic Characteristics of Medical and Nursing Students

Demographic Characteristics	category	Medical Students (n = 59) n (%)	Nursing Students (n = 28) n (%)	Total
Sex	Male	18 (30.50)	10 (35.70)	28 (32.20)
	Female	41 (69.50)	18 (64.30)	59 (67.80)
Married Status	Single	50 (84.70)	25 (89.30)	75 (86.20)
	Married	9 (15.30)	3 (10.70)	12 (13.80)
Level of Education	Intern	13 (22.00)	25 (89.30)	38 (43.67)
	Pre-Interns	46 (78.00)	3 (10.70)	49 (56.30)
Total		59 (67.80)	28 (32.20)	87(100)

Note. Values are presented as n (%). Percentages may not total 100 because of rounding.

Table 2. Mean And Standard Deviation Of Emotional Intelligence Among Medical And Nursing Students At The Clinical Level

Domain	Medical M (SD)	Nursing M (SD)	Mean Difference	95% CI	t	df	*p*	Cohen's d
Self-awareness	14.84 (3.03)	14.21 (1.93)	0.64	-0.43 - 1.71	1.19	77.76	0.239	0.23
Emotion management	14.33 (5.15)	12.21 (3.12)	2.12	0.02 - 4.22	2.01	85	0.048	0.46
Empathy	16.65 (6.22)	15.50 (2.94)	1.32	-0.96 - 3.59	1.15	85	0.253	0.21
Social skills	15.57 (2.62)	14.86 (2.39)	0.44	-0.94 - 1.82	0.63	85	0.528	0.28
Motivation	15.34 (8.30)	13.58 (3.07)	1.76	-1.47 - 4.99	1.08	85	0.281	0.25
Total Emotional Intelligence	87.90 (14.57)	81.02 (8.36)	6.58	0.57 - 12.58	2.18	85	0.032	0.53

Note. M = mean; SD = standard deviation; CI = confidence interval. *p values* are reported to three decimal places.

Table 3. Associations Of Age, Gender, And Educational Level With Total Emotional Intelligence Among Medical And Nursing Students

Variable	Category	N	Descriptive Statistic	Statistical Test	Z	*p*	Effect Size
Educational level	Pre-internship	59	91 (84.50–97.50)	Mann–Whitney U=575.00	-2.89	0.004	r = 0.31
	Internship	28	86 (79.50–90.00)				
Gender	Female	59	Mean rank=44.92	Mann–Whitney U=772.00	-0.49	0.623	r = 0.05
	Male	28	Mean rank=42.07				
Age	Total sample	87	Spearman's ρ =-0.124 (95% CI: -0.383 to 0.167)	—		0.347	—

Note. IQR = interquartile range; CI = confidence interval. *p* values are reported to three decimal places.

Table 4. Association Between Emotional Intelligence Level Among Medical And Nursing Students

Emotional intelligence level	Nursing students n (%)	Medical students n (%)	Total n (%)	*p*	Effect size
Low (<75)	5 (17.90)	5(8.50)	10 (11.50)	0.010[a]	Cramér's V = 0.293
Good capacity (75–99)	23 (82.10)	42 (71.20)	65 (74.70)		
High (≥100)	0 (0.0)	12 (20.30)	12 (13.80)		
Total	28 (100)	59 (100)	87 (100)		

[a] Fisher–Freeman–Halton exact test

There was a statistically significant association between educational level and EI level (Fisher–Freeman–Halton exact test, $p = 0.01$). The strength of this association was moderate (Cramér's V = 0.293) [Table 4].

Discussion

The present study aimed to compare the EI of medical and nursing students during clinical training. The results showed medical students demonstrated significantly higher total EI scores than nursing students with a medium effect size. This suggests that this difference is not only statistically significant but also practically meaningful. Among the EI domains, a statistically significant difference was observed only in emotion management .While no significant differences were observed in self-awareness, empathy, social skills, or motivation. Regarding EI categorization, the majority of students in both groups had moderate EI (72.9% of nursing students and 82.1% of medical students).

This finding partially contrasts with Choudry et al. (2023), who reported comparable EI between medical and paramedical students in the first year [21]. The observed difference in EI between the two groups may be partly attributable to the uneven sample sizes (59 medical vs. 28 nursing students) and the imbalanced distribution of educational levels, with a significantly higher proportion of nursing students being at the internship stage compared to medical students. Although greater clinical exposure among interns could potentially influence certain EI domains, this relationship should be interpreted cautiously due to the confounding effect of the field of study and uneven sample sizes.

Similarly, Talman et al. (2020), Horne et al. (2024), and Dewsnap et al. (2021) reported favorable levels of EI among medical and nursing students, further supporting the present findings. Taken together, these findings suggest that students in health professions generally demonstrate a satisfactory level of EI, regardless of their specific field of study [22-24].

Additionally, in this study, a statistically significant difference in total EI between pre-intern and intern students, with pre-intern students demonstrating significantly higher EI scores. This finding suggests that EI may vary across different stages of education. The higher EI among pre-intern students may stem from the fact that these students, particularly in the early stages of medical education, often enter university with greater enthusiasm, motivation, and optimism. This positive mindset can significantly enhance their emotional functioning. In contrast, clinical internship students typically face increased clinical responsibilities, heavier workloads, prolonged patient contact, and intense academic and professional pressures. These factors can lead to emotional exhaustion, heightened stress, and reduced emotional well-being, ultimately resulting in lower EI scores. Previous studies have shown that prolonged exposure to stressful clinical environments can negatively impact certain emotional competencies. In contrast to our findings, findings from a study by Bagle et al. (2021) of 200 undergraduate medical students over two years from January 2018 to February 2020 reported that overall EI increased gradually from the first to the fourth year of medical training [25]. However, they found that empathy and motivation declined as students progressed through their training. Consistent with the present findings, Tasdighi et al. (2021) also reported a significant association between EI and academic level [16]. In contrast, Vasfi et al. (2018) found lower EI among clinical students [26], while Horne et al. (2024) reported no significant differences across educational levels [23]. These inconsistent findings suggest that the relationship between educational stage and EI may be influenced by differences in curricula, clinical training environments, and study populations.

The present study did not find a significant relationship between EI and age or gender. Similar findings have been reported by Hanson et al. (2024), Mahanta et al. (2024), and Vasefi et al. (2018) [26-28]. However, other studies, including those by Mohamad et al. (2019), Budler et al. (2022), Shubayr and Dailah (2025), and Mohammadi et al. (2019) identified age, gender, or perceived stress as significant factors associated with EI [15, 29-31]. These inconsistent findings may be explained by

variations in participant characteristics, cultural and educational contexts, measurement instruments, and study designs. Since demographic characteristics alone do not consistently explain variations in EI across studies, future research should investigate additional factors that may contribute to its development.

Overall, the findings indicate that EI among medical and nursing students is at a good level. Given the established role of EI in communication, teamwork, stress management, and patient-centered care, its continuous assessment and reinforcement during undergraduate education remain important. Integrating educational strategies that promote emotional awareness, communication skills, and reflective practice may further strengthen these competencies and better prepare future healthcare professionals for the interpersonal and emotional demands of clinical practice.

This study has several limitations. First, the use of self-reported data may have introduced response bias, including social desirability bias. Second, the cross-sectional design precludes causal inferences regarding the relationships examined. Third, the study was conducted at a single institution with a relatively small sample size (n = 87), a moderate response rate (52%), and unequal group sizes between medical and nursing students, particularly the smaller number of nursing students. These factors may have made it more difficult to detect small or moderate differences between the groups and may limit the generalizability of the findings. Therefore, the results should be interpreted with caution. Future research should employ larger, multicenter, and longitudinal studies to better understand the development of EI throughout clinical training and to evaluate the effectiveness of targeted educational interventions. In addition, qualitative approaches may provide deeper insights into students' experiences and the factors influencing EI development.

Conclusion

Based on the findings of the present study, A significant difference was observed in EI between medical and nursing students, and EI was not significantly associated with age or gender. Differences between the present findings and those of previous studies may be explained by variations in measurement instruments, study populations, sample sizes, and cultural or educational contexts. Given the importance of EI in healthcare education, implementing evidence-based educational workshops may help strengthen these competencies among medical and nursing students.

Ethical Considerations

The study protocol was approved by the institutional review board of Bushehr University of Medical Sciences.

(Approval No IR.BPUMS.REC.1402.101).

Participants were provided with sufficient information about the study objectives. They were informed that participation was voluntary and that they could withdraw at any time without penalty. Following verbal consent, they were assured of the anonymity of the questionnaires, the strict confidentiality of their data, and that the information would be analyzed collectively with no individual consequences.

The study results would also be shared with them upon request.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Authors' Contributions

Conceptualization: N. Jafari
Methodology: S. Ebneroomi, N. Jafemian
Writing – Review & Editing: A. Azemian, N. Jafari, S. Ebneroomi, M. Mokhtari Zanjani
Supervision: A. Azemian, N. Jafari, M. Mokhtari Zanjani
All authors read and approved the final manuscript.ari, A. Azemian
Data Curation: A. Azemian, S. Ebneroomi, M. Mokhtari Zanjani
Investigation: A. Azemian, S. Ebneroomi, M. Mokhtari Zanjani
Formal Analysis: A. Azemian, M. Mokhtari Zanjani
Writing – Original Draft: N. Jafari, S. Ebneroomi, A. Az

Artificial Intelligence Utilization

In the preparation of this manuscript, artificial intelligence tool (Chat GPT4) was utilized solely for the purpose of editing and improving the structure of Persian and English sentences. No scientific content generation, data analysis, or alteration of results was performed by artificial intelligence. The authors remain fully responsible for the scientific integrity, analyses, and findings presented in this study.

Data Availability Statement

The data analyzed during this study are available from the corresponding author on reasonable request.

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