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Assessment of emotional intelligence, self-efficacy, and perceived stress among nursing students in clinical practice: a cross-sectional study

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Abstract

Background Emotional intelligence is a critical competency in nursing, influencing stress management, self-efficacy, and overall professional competence. Senior students engaged in clinical practice face unique challenges that can impact their stress levels, decision-making abilities, and interactions with patients. This study aimed to assess the emotional intelligence, self-efficacy, and perceived stress among nursing students engaged in clinical practice.

Methods A cross-sectional study using convenience sampling was conducted from August 2024 to February 2025 among 324 undergraduate nursing students enrolled in clinical practice courses at Jazan University. Emotional intelligence was measured using the Schutte Self-Report Emotional Intelligence Test (SSEIT), self-efficacy was assessed with the General Self-Efficacy Scale (GSE-10), and stress was gauged using the Perceived Stress Scale (PSS-4). Correlation analyses and multiple linear regression were used to identify significant relationships and predictors of emotional intelligence.

Results Of the 324 participating nursing students, 56% were female. The mean total scores were 120.59 ± 20.78 for emotional intelligence, 28.56 ± 8.02 for self-efficacy, and 7.15 ± 2.11 for perceived stress. Among emotional intelligence domains, the highest mean scores were observed in utilizing emotion (3.81 ± 0.79), while the lowest were in perception of emotion (3.54 ± 0.60). Emotional intelligence domains showed strong positive inter-correlations. 'Managing self-emotion' was positively correlated with self-efficacy (p = 0.022), while both 'perception of emotion' and 'managing self-emotion' were negatively correlated with perceived stress ($p = 0.020$ and $p = 0.021$, respectively). Regression analysis revealed gender ($p = 0.016$) and perceived stress ($p = 0.027$) as significant predictors of emotional intelligence, with females exhibiting higher emotional intelligence scores.

Conclusion This study highlights the critical role of emotional intelligence in nursing education and its relationship with self-efficacy and stress levels. Given these findings, integrating structured emotional intelligence training into nursing curricula is essential. This can be achieved through mindfulness-based emotional regulation programs to enhance stress resilience, scenario-based simulations to improve emotional perception and management, and

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peer-mentorship initiatives to strengthen self-efficacy. Implementing these targeted strategies can enhance nursing students' emotional intelligence, reduce stress-related impairments, and improve both student well-being and professional competence.

Clinical trial number Not applicable.

Keywords Emotional intelligence, Nursing students, Self-efficacy, Perceived stress, Clinical practice, Nursing education

Background

Emotional intelligence (EI) is widely regarded as the capacity to perceive, understand, and regulate emotions in oneself and others, integrating emotional awareness with cognitive processing to bolster interpersonal skills and effective coping [1, 2]. This competency has attracted growing interest in health-related fields, where the ability to empathize, communicate clearly, and maintain composure is indispensable [3]. In nursing, EI underpins key professional attributes such as compassion, clinical judgment, and resilience—factors critical to managing complex patient needs and the day-to-day pressures inherent in healthcare settings [4].

Nursing students face academic and clinical stressors such as heavy coursework, emotional patient interactions, and the pressure to develop skills quickly. These challenges can affect their mental well-being, academic performance, and ability to adapt to nursing training [5, 6]. These pressures can affect mental well-being, academic performance, and overall adaptation to the rigorous demands of nurse training [7]. Empirical evidence suggests that individuals with higher EI demonstrate stronger stress-management techniques and more adaptive coping strategies, potentially leading to lower burnout rates and better clinical performance [1, 8]. Nonetheless, research focusing on the precise ways EI influences nursing students' capacity to handle both educational and clinical responsibilities is relatively scarce [9].

In addition to EI, nursing students' self-efficacy—another critical psychological resource—strongly influences their capacity to manage clinical demands. Self-efficacy, the belief in one's capacity to accomplish tasks and achieve goals [10], also plays an essential role in shaping student success within nursing programs [2]. Students who perceive themselves as capable are more likely to persist through challenges, apply problem-solving techniques effectively, and engage more confidently in clinical tasks [4]. Coupled with EI, self-efficacy can strengthen students' ability to cope with the emotional and technical demands of patient care [11]. By examining the relationship between these two constructs, educators and policymakers can craft targeted interventions that support skill development and enhance overall student readiness [12, 13].

While EI and self-efficacy contribute positively to student performance and well-being, stress remains a pervasive concern among nursing trainees. Frequent examinations, high-stakes clinical assessments, and the emotional toll of patient care can create a sustained sense of pressure [14, 15]. If unmanaged, these stressors may result in diminished psychological health, reduced empathy toward patients, and compromised academic outcomes [7]. However, prior studies indicate that students who demonstrate higher EI often adopt more effective coping mechanisms, thus mitigating stress-related difficulties and preserving emotional stability [9]. These findings highlight the potential of EI as a buffer against the detrimental effects of stress.

Despite growing recognition of EI's role in nursing students' psychological well-being and clinical competence, existing research in Saudi Arabia has primarily focused on either EI or perceived stress, with limited exploration of the relationships among EI, self-efficacy, and stress in nursing students during clinical practice rotations. While studies have examined the EI levels of nursing students [16] and their general stress levels [17], no study has specifically investigated the relationships among EI, self-efficacy, and perceived stress in Saudi nursing students during clinical practice rotations. Furthermore, while research has explored EI and stress among Saudi health science students [18] and EI, self-efficacy, and stress among students from the College of Medicine [19], these studies were not conducted specifically on nursing students and may not fully capture the unique challenges faced in nursing education. Although several international studies have explored these relationships in nursing students [20–25], none have specifically focused on those engaged in clinical practice rotations, where EI and self-efficacy may play a crucial role in managing stress and enhancing clinical performance. Additionally, there is a lack of research translating these psychological insights into targeted curricular interventions within Saudi nursing programs. Addressing these gaps, this study assessed EI, self-efficacy, and perceived stress among nursing students engaged in clinical practice and examined the relationships among these variables. The findings will provide valuable insights for educators and policymakers to develop culturally relevant curricular enhancements that prioritize EI development, confidence-building, and

resilience training, ultimately improving student readiness for professional nursing roles.

Methods and materials

Study design, setting and population

A cross-sectional study was conducted at Jazan University, Saudi Arabia, from August 2024 to February 2025. This institution, located in the southwestern region of Saudi Arabia, offers various healthcare-related programs, including nursing. This study targeted undergraduate nursing students in their third year or higher who had begun clinical practice courses. Eligibility criteria included students who had completed at least two years of the undergraduate nursing program and had commenced clinical training. Students with no clinical practice experience were excluded from participation. Students diagnosed with psychiatric conditions or currently under treatment for psychiatric illness were excluded to control potential confounders related to perceived stress.

Sample size calculation

A priori power analysis was conducted using G*Power with the following parameters: an effect size of 0.3, a significance level of 0.80 ($\alpha = 0.20$), and a desired power of 0.95. This analysis estimated that a minimum sample of 180 participants was needed to detect a moderate effect size with adequate statistical power. To account for potential dropouts or incomplete surveys, the target sample size was increased by approximately 20%, resulting in an intended recruitment of around 216 participants. These figures were further informed by a small pilot test ($n = 20$) that helped to refine the estimated effect size and confirm the feasibility of the data collection instruments. A total of 470 nursing students were invited to participate in the study, of whom 324 completed the survey, yielding a response rate of 69%.

Recruitment and sampling

Convenience sampling was employed to recruit eligible participants. Convenience sampling was chosen due to its practicality, cost-effectiveness, and feasibility, considering the accessibility and availability of nursing students enrolled in clinical practice courses at Jazan University. Students were invited via an official online platform with a message explaining the study's objectives and voluntary participation. The message included a link to the online questionnaire on Google Forms. To enhance response rates, a follow-up reminder message was sent one week after the initial invitation. The sampling duration extended to seven months to accommodate academic schedules, student rotations in clinical placements, and maximize participation. This extended period ensured that students across different semesters and clinical rotations had an equal opportunity to participate, reducing the risk of selection bias due to timing constraints.

Ethical considerations

Ethical approval for the study was obtained from the Institutional Review Board (IRB). Informed electronic consent was obtained from all participants via Google Forms before they proceeded with the survey. Participants were assured of the confidentiality of their responses and informed that they could withdraw at any time without adverse consequences. All procedures were conducted in accordance with the institutional ethical standards and the 1964 Helsinki Declaration and its later amendments.

Data collection tool

Data were collected using a comprehensive, self-administered questionnaire consisting of four sections. The first section captured demographic information including sex, age, academic GPA, year of study, and engagement in regular physical activity (at least 150 min of moderate-intensity exercise or 75 min of vigorous-intensity exercise per week). Regular physical activity was included as a demographic variable based on previous evidence suggesting its potential association with emotional resilience, self-efficacy, and stress management abilities among nursing students [26–29].

The scales used in the questionnaire have been previously validated for use in both academic and professional settings and have been widely applied in previous studies assessing EI, self-efficacy, and perceived stress in various populations, including healthcare students and professionals. The second section of the questionnaire assessed EI using the Schutte Self-Report Emotional Intelligence (SSREI) Scale [30], which comprises 33 items across four domains: (1) emotion perception (8 items), which focuses on the ability to identify emotions in oneself and others; (2) managing self-relevant emotions (9 items), which involves techniques for regulating one's own emotional states; (3) managing others' emotions (8 items), which pertains to influencing the emotional states of others; and (4) utilizing emotions (8 items), which examines the use of emotional information to enhance reasoning and problem-solving. Each item is rated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), with higher scores indicating more developed EI skills. This scale has been validated and widely used in similar contexts, demonstrating strong reliability and relevance for assessing EI in academic settings [30].

The third section measured self-efficacy through the General Self-Efficacy (GSE) Scale, a 10-item tool that evaluates an individual's belief in their capability to perform tasks and handle challenges. Responses are recorded on a 4-point Likert scale (1 = Not at all true,

4 = Exactly true). The GSE Scale was selected due to its broad validation across diverse populations, including healthcare students. Generic tools enable comparisons with existing literature, facilitating greater generalizability and interpretability of findings. Additionally, specific self-efficacy instruments explicitly related to clinical tasks in nursing students were limited, making the generic GSE Scale the most appropriate choice for this study [31].

Finally, perceived stress was assessed using the 4-item Perceived Stress Scale (PSS-4), which measures how often participants feel stressed. Items are scored on a 5-point Likert scale (0 = Never, 4 = Very Often), with higher scores indicating greater perceived stress. The PSS-4 has been validated for use in academic populations and is frequently used to assess stress levels in studies involving healthcare professionals and students [32].

The questionnaire's face and content validity were evaluated by two experts: one expert specialized in nursing education and the other in psychometric assessments. Internal consistency was evaluated using Cronbach's alpha, which was 0.79. The calculated Cronbach's alpha values were 0.89 for SSREI, 0.85 for GSE, and 0.67 for PSS-4.

Data analysis

Data were analyzed using IBM SPSS (version 26.0; Armonk, NY: IBM Corp.). Given the non-normal data distribution (Shapiro–Wilk test), non-parametric methods were applied. Descriptive statistics summarized demographic variables and mean and total scores. Group differences were assessed using the Mann–Whitney U test (two-category variables) and the Kruskal–Wallis test (three or more categories). Total scores for EI, self-efficacy, and perceived stress were calculated, and Spearman's correlation examined their relationships. Multiple linear regression identified predictors of total EI scores, incorporating demographic variables, self-efficacy, and perceived stress. Statistical significance was set at $p < 0.05$.

Results

The study encompassed 324 nursing students (Table 1), with a gender distribution of 56% females and 44% males. Academic performance primarily fell between GPAs of 4.01–4.5 (35.4%) and 3.51–4.0 (26%). A majority of students were in their fourth year (55%), and 40% reported engaging in regular physical activity. Females exhibited significantly higher perceived stress levels than males (7.63 vs. 6.54, $p = 0.008$). Among academic GPA groups, there were significant statistical differences in self-efficacy scores ($p = 0.032$). Further pairwise comparisons revealed that students with GPAs of 3.51–4.0 had significantly lower self-efficacy scores compared to those in the 4.01–4.5 GPA group.

Table 2 presents a detailed analysis of EI scores across four domains among nursing students. In the perception of emotion domain, the highest-rated item was "I am aware of my emotions as I experience them." (mean 3.76 ± 1.02), while the lowest was "It is difficult for me to understand why people feel the way they do." (mean 3.12 ± 1.13). For managing self-emotion, the highest-rated item was "I seek out activities that make me happy." (4.00 ± 0.95), while the lowest was "I have control over my emotions." (3.30 ± 1.13). In the managing others' emotion domain, the highest score was for "I compliment others when they have done something well." (4.01 ± 0.99), whereas the lowest was "I like to share my emotions with others." (2.89 ± 1.23). Within the utilizing emotion domain, the highest-rated item was "Some of the major events of my life have led me to re-evaluate what is important and not important." (4.02 ± 0.94), while the lowest was "When my mood changes, I see new possibilities." (3.52 ± 0.99). The overall mean scores for each domain were 3.54 ± 0.60 for perception of emotion, 3.77 ± 0.68 for managing self-emotion, 3.55 ± 0.73 for managing others' emotion, and 3.81 ± 0.79 for utilizing emotion, with an overall EI mean score of 3.65 ± 0.63. Additionally, all EI domains were positively and significantly correlated with each other. Notably, the managing others' emotion domain was the only EI domain

Table 1 Demographic characteristics and psychometric scores (Mean ± SD) of nursing students

Item	Variables	Count (%)	Emotional intelligence	*P* value	Self-efficacy	*P* value	Perceived stress	*P* value
Sex	Female	180 (56%)	122.42 ± 20.42	0.27	28.53 ± 8.43	> 0.90	7.63 ± 2.08	**0.008**
	Male	144 (44%)	118.31 ± 21.23		28.58 ± 7.56		6.54 ± 2.00	
Academic GPA	≤ 3.5	60 (19%)	118.00 ± 25.16	0.82	27.15 ± 8.31	**0.032**	7.60 ± 1.14	0.31
	3.51–4.0	84 (26%)	122.68 ± 22.05		24.93 ± 8.84		7.32 ± 1.91	
	4.01–4.5	117 (36%)	119.67 ± 19.86		30.85 ± 7.18		7.18 ± 2.29	
	> 4.5	63 (19%)	122.00 ± 16.95		30.48 ± 6.36		6.43 ± 2.62	
Academic year	Third year	147 (45%)	119.86 ± 22.76	0.95	29.43 ± 7.89	0.26	7.04 ± 2.13	0.43
	Fourth Year	177 (55%)	121.20 ± 19.16		27.83 ± 8.12		7.24 ± 2.10	
Regular physical activity	Yes	129 (40%)	120.88 ± 19.03	0.77	27.26 ± 8.36	0.14	7.26 ± 1.63	0.7
	No	195 (60%)	120.40 ± 22.01		29.42 ± 7.73		7.08 ± 2.38	

Note: Bold *p*-values indicate statistical significance

Table 2 Emotional intelligence domain scores and item-level analysis among nursing students

Items	Agreement rate	Mean ± SD
Perception of emotion		
I find it hard to understand the non-verbal messages of other people.	60 (18.52%)	3.61 ± 1.09
I am aware of my emotions as I experience them.	222 (68.52%)	3.76 ± 1.02
I am aware of the non-verbal messages I send to others.	186 (57.40%)	3.60 ± 0.98
By looking at their facial expressions, I recognize the emotions people are experiencing.	162 (50.00%)	3.47 ± 0.93
I know why my emotions change.	201 (62.04%)	3.64 ± 1.08
I easily recognize my emotions as I experience them.	201 (62.04%)	3.67 ± 1.05
I am aware of the non-verbal messages other people send.	210 (64.82%)	3.72 ± 1.03
I know what other people are feeling just by looking at them.	135 (41.67%)	3.29 ± 1.12
I can tell how people are feeling by listening to the tone of their voice.	162 (50.00%)	3.51 ± 1.01
It is difficult for me to understand why people feel the way they do.	87 (26.85%)	3.12 ± 1.13
Overall		3.54 ± 0.6
Managing self-emotion		
When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.	234 (72.22%)	3.89 ± 0.97
I expect that I will do well on most things I try.	228 (70.37%)	3.90 ± 0.98
I expect good things to happen.	231 (71.30%)	3.86 ± 0.85
When I experience a positive emotion, I know how to make it last.	153 (47.22%)	3.44 ± 0.96
I seek out activities that make me happy.	231 (71.30%)	4.00 ± 0.95
I have control over my emotions.	147 (45.37%)	3.30 ± 1.13
I motivate myself by imagining a good outcome to tasks I take on.	240 (74.08%)	3.96 ± 0.92
When I am faced with a challenge, I give up because I believe I will fail.	51 (15.74%)	3.81 ± 1.14
I use good moods to help myself keep trying in the face of obstacles.	216 (66.67%)	3.79 ± 1.00
Overall		3.77 ± 0.68
Managing others emotion		
I know when to speak about my personal problems to others.	207 (63.88%)	3.69 ± 1.08
Other people find it easy to confide in me.	180 (55.55%)	3.65 ± 0.90
I like to share my emotions with others.	90 (27.77%)	2.89 ± 1.23
I arrange events others enjoy.	114 (35.19%)	3.11 ± 1.08
I present myself in a way that makes a good impression on others.	204 (62.97%)	3.70 ± 0.99
I compliment others when they have done something well.	234 (72.22%)	4.01 ± 0.99
When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself.	189 (58.33%)	3.62 ± 1.02
I help other people feel better when they are down.	198 (61.11%)	3.71 ± 1.03
Overall		3.55 ± 0.73
Utilizing emotion		
Some of the major events of my life have led me to re-evaluate what is important and not important.	252 (77.77%)	4.02 ± 0.94
When my mood changes, I see new possibilities.	168 (51.86%)	3.52 ± 0.99
Emotions are one of the things that make my life worth living.	201 (62.04%)	3.76 ± 0.99
When I am in a positive mood, solving problems is easy for me.	219 (67.59%)	3.86 ± 1.06
When I am in a positive mood, I am able to come up with new ideas.	243 (75.00%)	4.01 ± 0.93
When I feel a change in emotions, I tend to come up with new ideas.	192 (59.26%)	3.70 ± 0.95
Overall		3.81 ± 0.79

Note: 'Agreement rate' represents the combined percentage of responses indicating 'Strongly Agree' and 'Agree

that showed a statistically significant difference based on demographic variables, with female students scoring higher than male students ($p = 0.018$).

Table 3 summarizes the relationships between EI, its domains, self-efficacy, and perceived stress. EI exhibited strong positive correlations with all four EI domains, confirming the internal coherence of the construct. While overall EI was positively correlated with self-efficacy and negatively correlated with perceived stress, these relationships were not statistically significant. However, certain EI domains demonstrated statistically significant correlations. Managing self-emotion was positively correlated with self-efficacy ($p < 0.05$), while both perception of emotion and managing self-emotion were negatively correlated with perceived stress ($p < 0.05$). Additionally, self-efficacy was negatively correlated with perceived stress ($p < 0.01$).

Table 3 Correlations between emotional intelligence domains, general self-efficacy, and perceived stress

Variable	Total score (Mean ± SD)	Emotional intelligence	Self-efficacy	Perceived stress
Perception of emotion	35.39 ± 6.06	0.85 ***	0.06	−0.20 *
Managing self-emotion	33.94 ± 6.13	0.89 ***	0.22 *	−0.21 *
Managing others' emotion	28.39 ± 5.89	0.89 ***	0.11	−0.09
Utilizing emotion	28.39 ± 5.89	0.87 ***	0.13	−0.16
Emotional intelligence	120.59 ± 20.78	—	0.16	−0.19
Self-efficacy	28.56 ± 8.02	0.16	—	−0.27 **
Perceived stress	7.15 ± 2.11	−0.19	−0.27 **	—

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4 Multiple linear regression analysis of predictors influencing emotional intelligence among nursing students

Predictor	Estimate	SE	t	*p*
Intercept [a]	143.23	13.16	10.88	< 0.001
Sex:				
Male – Female	-8.45	4.55	-1.86	**0.016**
Academic GPA:				
≤ 3.5 – >4.5	-4.81	6.74	-0.71	0.477
3.51–4.0 – >4.5	2.82	6.17	0.46	0.649
4.01–4.5 – >4.5	1.01	5.74	0.18	0.861
Self-efficacy	-0.09	0.27	-0.34	0.733
Perceived stress	-2.3	1.03	-2.24	**0.027**

Note: $R^2 = 0.32$

Note: Bold *p*-values indicate statistical significance

Table 4 presents the multiple linear regression analysis assessing the predictors of overall EI when all variables were included in the model. The regression model explained 32% of the variance in EI ($R^2 = 0.32$). Gender emerged as a significant predictor, with female students displaying higher EI scores than male students ($p = 0.016$). Additionally, perceived stress was a significant predictor, with higher stress levels associated with lower EI scores ($p = 0.027$).

Discussion

The present study assessed EI, self-efficacy, and perceived stress among nursing students engaged in clinical practice. The total EI score was 120.59 ± 20.78, which is substantially lower than the 151.3 ± 1.9 reported among fourth-year nursing students in Palestine [33]. Several previous studies indicate that nursing students generally exhibit moderate to high EI levels, which play a crucial role in their professional competence [34–36]. Self-efficacy in this study was 28.56 ± 8.02, closely aligning with the 28.58 ± 5.79 reported among nursing students in Turkey [37] but slightly higher than the 26.08 ± 4.65 found in undergraduate nursing students in China [38]. Perceived stress had a mean score of 7.15 ± 2.11, comparable to the 7.4 ± 3.4 reported among students in Qatar [39], indicating a moderate level of stress among nursing students across different regions. This finding aligns with earlier research, which suggests that nursing students typically experience moderate stress due to academic and clinical demands [15, 40]. These results highlight variations in EI, whereas self-efficacy and stress levels appear relatively consistent across populations. Given the lower EI scores observed in this study, targeted educational interventions are needed to enhance EI in nursing students while reinforcing self-efficacy and stress management strategies to support their clinical performance.

Furthermore, strong inter-domain correlations suggest that improvements in one domain could contribute to enhancements in others, aligning with studies that highlight the interconnected nature of EI domains [34, 36, 41, 42]. Among the EI domains, utilizing emotion had the highest mean score (3.81 ± 0.79), suggesting that students effectively use emotions to reassess their priorities. This aligns with findings by Li and Wang [43], who reported that nursing students often utilize emotions to guide personal and professional growth. In contrast, perception of emotion had the lowest mean score (3.54 ± 0.60), indicating challenges in understanding the emotions of others, which is consistent with several previous studies [7, 44], who found that nursing students sometimes struggle with emotional perception due to clinical stressors. This difficulty likely stems from the emotionally demanding clinical environment, where students must balance patient care with developing their own emotional awareness. As a result, targeted educational interventions that emphasize emotional perception training, such as scenario-based learning and reflective practice, are essential

for improving students' ability to recognize and interpret emotions in clinical settings.

Among individual items, the highest-rated statement was "I compliment others when they have done something well" in the managing others' emotion domain, with a mean score of 4.01 ± 0.99, indicating that students are proactive in recognizing positive behaviors in others. This aligns with findings from Por et al., who reported that nursing students excel in reinforcing positive emotional interactions [7]. In contrast, the lowest-rated item was "I like to share my emotions with others" in the same domain, scoring 2.89 ± 1.23. This reluctance to share personal emotions mirrors previous research [8, 45, 46], which found that nursing students often struggle with emotional disclosure in clinical settings. While students demonstrated strong abilities in recognizing and affirming positive emotions in others, they reported difficulty in sharing their own emotions. This may stem from professional training, which emphasizes emotional regulation to maintain composure in clinical settings, or cultural norms discouraging emotional disclosure. These findings suggest that while nursing students support others emotionally, they may need additional guidance in expressing their own emotions comfortably [3].

The correlation analysis revealed significant relationships between EI domains and self-efficacy and perceived stress. Managing self-emotion demonstrated a significant positive correlation with self-efficacy ($p = 0.022$), suggesting that students who are better at regulating their emotions tend to have greater confidence in their abilities. This finding supports previous research indicating that individuals with strong self-belief in their capabilities tend to regulate their emotions more effectively [47, 48]. Conversely, perception of emotion and managing self-emotion exhibited significant negative correlations with perceived stress ($p = 0.020$ and $p = 0.021$, respectively), suggesting that stress may weaken specific aspects of EI, particularly emotional awareness and self-regulation. These findings align with previous research emphasizing the role of stress management in sustaining EI [8, 48]. Linear regression analysis identified perceived stress as a significant negative predictor of total EI scores, suggesting that higher stress levels are associated with lower EI across multiple domains. These findings align with previous research indicating that heightened stress may reduce emotional processing abilities, particularly in professional settings [8, 40, 49].

Additionally, the study found a significant gender difference in the managing others' emotions domain ($p = 0.018$), indicating that female students demonstrated higher proficiency in recognizing and influencing others' emotions. Linear regression confirmed gender as a significant predictor of EI, with female students scoring higher overall, consistent with research showing that women exhibit greater emotional awareness and regulation [5, 36, 50–53]. Despite reporting higher stress levels than males (7.63 vs. 6.54, $p = 0.008$), females achieved higher EI scores, particularly in managing others' emotions, suggesting that gender-related differences in EI persist under elevated stress. One explanation is that women often use emotion-focused coping strategies, such as social support-seeking and emotional regulation, which may mitigate stress effects on EI [54, 55]. Prior research indicates that women rely more on adaptive coping mechanisms, whereas men tend to employ problem-focused or avoidance strategies [55]. The absence of a significant correlation between perceived stress and the managing others' emotions domain (Table 3) implies that this EI component remains resilient to stress-related declines, aligning with studies showing that EI moderates stress effects and enhances emotional regulation in healthcare students [11, 56]. These findings underscore the need for gender-sensitive EI training in nursing curricula. Training programs might leverage female students' strengths in emotional regulation while supporting male students in developing interpersonal and emotional awareness skills. Future research should examine how gender-specific coping mechanisms influence the relationship between stress and EI in nursing students, as EI plays a crucial role in moderating stress and improving academic performance [11, 56].

Regarding the relationship between self-efficacy and perceived stress, the findings show a significant negative correlation ($p < 0.01$), indicating that higher self-efficacy is linked to lower stress levels. This aligns with research suggesting that greater self-efficacy enhances coping strategies, resilience, and psychological well-being [57]. In nursing education, where students face academic and clinical challenges, self-efficacy may serve as a protective factor against stress-related impairments [58].

Contrary to expectations and what reported in several previous studies [41, 43], academic performance and physical activity were not significantly associated with overall EI and its domains. This suggests that EI may function independently of academic success and lifestyle factors in this cohort. While students with lower GPAs reported lower self-efficacy, GPA was not linked to EI, and the correlation between EI and self-efficacy was weak. This indicates that confidence in one's abilities has a limited influence on EI. These findings support the perspective that intellectual ability alone does not determine success. Research suggests that IQ contributes only a small portion to lifetime success, while EI—including motivation, perseverance, impulse control, empathy, and hope—plays a greater role [59]. This underscores the importance of fostering emotional skills alongside academic achievements.

Limitations and future research

This study has several limitations. The sample was limited to one institution, reducing generalizability, and GPA alone may not fully capture academic performance. Its cross-sectional design prevents causal conclusions, and reliance on self-reported measures introduces potential bias. Unmeasured factors such as personality traits, clinical exposure, and cultural influences may also impact EI. The study found no significant correlation between EI and physical activity, but other lifestyle factors were not assessed. Additionally, gender differences in EI were observed but not explored in depth. Future research should employ longitudinal designs, objective EI assessments, and diverse samples, incorporating broader academic and psychological measures to better understand the development and impact of EI in nursing students.

Conclusion

This study identified moderate EI levels among nursing students, with strong interconnections across EI domains. While students demonstrated strengths in utilizing emotions for personal growth, they faced challenges in accurately perceiving and managing emotions, particularly under stress. The positive association between emotional regulation and self-efficacy, along with the inverse relationship between perceived stress and emotional clarity, underscores the critical role of emotional competencies in nursing education. Given these findings, nursing curricula should integrate structured EI training using evidence-based strategies. Future research should explore multi-institutional comparisons and longitudinal assessments to examine the long-term development of EI and its impact on clinical decision-making and patient care outcomes. Additionally, investigating the effectiveness of structured EI interventions will be crucial in refining best practices for nursing education and improving emotional resilience in healthcare settings.

Implication of the study

The findings underscore the necessity of integrating structured EI training into nursing curricula, particularly targeting emotional perception and regulation skills. Given the observed associations between EI, self-efficacy, and stress, nursing programs should implement evidence-based interventions to enhance students' emotional resilience and clinical competence. This can be achieved through mindfulness-based emotional regulation techniques (e.g., guided reflection sessions to improve self-awareness), peer-support programs (e.g., mentorship initiatives where senior students guide junior students in managing clinical stressors), and scenario-based simulations (e.g., role-playing exercises in simulated patient interactions to develop emotional perception and response skills). These targeted interventions can help nursing students enhance emotional awareness, manage stress more effectively, and improve their ability to navigate patient care challenges. Furthermore, the observed gender differences in EI highlight the need for tailored training approaches that address diverse emotional learning needs. Female students may benefit from advanced emotional labor management strategies, while male students may require interventions focused on emotional awareness and interpersonal communication to strengthen their EI skills. Moreover, the limited relationship between EI and traditional academic metrics highlights the importance of holistic evaluation frameworks in nursing education. Incorporating structured reflections, EI appraisals, and resilience assessments alongside GPA evaluations could provide a more comprehensive understanding of students' readiness for clinical practice.

Abbreviation

EI Emotional Intelligence

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Data availability

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

Declarations

Ethics approval and consent to participate

The study adhered to ethical guidelines, complied with the principles of the Declaration of Helsinki, obtaining electronic informed consent to ensure the participants' awareness of the study's aims, voluntary participation, and confidentiality. Jazan University's institutional review board approved the study, ensuring ethical procedures (approval code: REC-46/07/1377).

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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