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ORIGINAL ARTICLE

Enhancing Emotional Intelligence to Reduce Stress among Health Sciences Students: A Post-COVID-19 Case Study in Vietnam

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ABSTRACT

In health sciences education, managing psychological stress is a growing concern that highlights the importance of enhancing emotional intelligence (EI) as a core adaptive competence. This study examines the relationship between EI and perceived stress among Health Sciences undergraduates at Nguyen Tat Thanh University, providing baseline evidence for a future EI intervention program. Using a descriptive cross-sectional design, the data were collected from 100 participants through two validated self-reporting instruments: the Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF) and the Perceived Stress Scale (PSS). Descriptive and inferential statistics, including a one-way ANOVA, were processed to compare EI levels across stress categories. The results revealed significant differences in Trait EI among three stress groups - low ($M = 4.97$, $SD = 0.71$), moderate ($M = 4.34$, $SD = 0.47$), and high ($M = 3.59$, $SD = 0.58$) - with an overall effect of $F(2, 97) = 27.041$, $p < .001$. Post hoc analysis confirmed an inverse association between EI and perceived stress, indicating that students with higher EI experience lower stress levels. Grounded in Mikolajczak et al.'s (2009) three-level model of emotional competencies, the study proposes a structured EI intervention to strengthen emotional knowledge, abilities, and dispositions that support resilience and well-being in health sciences training. Despite limitations in sample size and institutional scope, the findings offer a robust empirical foundation for future longitudinal and experimental studies evaluating the effectiveness of EI-based interventions in health education.

1. INTRODUCTION

Mental health disorders have become a global public health priority, with depression and anxiety ranking among the leading causes of disease burden worldwide. The World Health Organization (WHO, 2020) estimates that over 350 million people suffer from depression, a figure projected to make it the leading contributor to global disease burden by 2030. In Vietnam, the situation mirrors global trends: Vietnam's Ministry of Health (2023) reported that nearly 14 million Vietnamese adults exhibited symptoms of anxiety or depression in the post–COVID-19 period. The prevalence of stress-related disorders is particularly alarming among university students, who face academic, social, and economic pressures during their formative years. Within this demographic, health sciences students experience exceptionally high stress levels due to demanding curricula, clinical training, and ethical responsibilities associated with future medical practice. A cross-sectional study across eight Vietnamese medical universities found that 43.2% of medical students exhibited symptoms of depression, with a notable portion reporting suicidal ideation (Tran, 2015). More recently, Luu and Le (2024) observed that fourth-year students at Nguyen Tat Thanh University (NTTU) reported the highest rates of constant stress (33.7%), reflecting the cumulative strain of academic and professional transition.

While previous studies have established the prevalence of psychological distress in Vietnamese health science students, fewer have regarded Emotional Intelligence (EI) as an individual psychological resource to buffer stress. Emotional Intelligence, broadly defined as the ability to perceive, understand, and regulate emotions in oneself and others (Salovey & Mayer, 1990; Goleman, 1995), has been linked to improved mental health, coping, and resilience (Kotsou et al., 2018). Among existing conceptualizations, Trait Emotional Intelligence (Trait EI) - as operationalized by the Trait Emotional Intelligence Questionnaire (TEIQue) developed by Petrides (2010) - is particularly useful for assessing stable emotion-related dispositions such as self-control, emotionality, and stress management. Trait EI represents individuals' self-perceptions of emotional efficacy and has been shown to predict well-being, social functioning, and reduced stress beyond traditional personality traits (Petrides et al., 2016; Siegling et al., 2015). Its predictive power has been demonstrated across domains of health, education, and clinical practice, underscoring its relevance for student populations under chronic academic strain.

From a theoretical standpoint, this study is grounded in the transactional model of stress and coping (Lazarus & Folkman, 1987), which defines stress as the perceived imbalance between demands and resources. Also, Lazarus and Launier (1978, as cited in Ogden, 2022) considered stress a transaction between people and the environment. This process-oriented framework posits that people no longer passively respond to stress but instead actively interact with stressors through a dynamic person-environment interaction, which is mediated by two critical appraisal processes (Lazarus & Folkman, 1987; Ogden, 2022). According to Ogden (2022), when faced with a stressful event such as an exam, a student's appraisal of the event ("is it stressful?") and their appraisal of personal resources ("will I cope?") can play a decisive role in their level of stress.

Within this model, EI is conceptualized as a crucial antecedent personal resource that shapes these mediating processes between potential stressors and stress (Mikolajczak & Luminet, 2008) and functions as the individual disposition that facilitates the selection of more adaptive coping strategies (Laborde et al., 2012, as cited in Campo et al., 2015). Research on trait EI indicates that individuals high in this quality are more prone to appraise stressful situations as a manageable challenge (signifying potential for gain) rather than a threat (signifying potential for loss) (Mikolajczak & Luminet, 2008; Tomaka et al., 1997, as cited in Mikolajczak & Luminet, 2008; Tomaka et al., 1993, as cited in Mikolajczak & Luminet, 2008). EI also significantly impacts the coping appraisal, which is the evaluation of available coping options and one's self-efficacy to manage the situation (Mikolajczak & Luminet, 2008). High trait EI individuals typically exhibit greater coping self-efficacy, which reduces the perceived threat of the problem (Mikolajczak & Luminet, 2008). EI, which fundamentally encompasses the ability to manage and regulate emotions, is directly linked to successful stress management (Campo et al., 2015; Laborde et al., 2014, as cited in Campo et al., 2015).

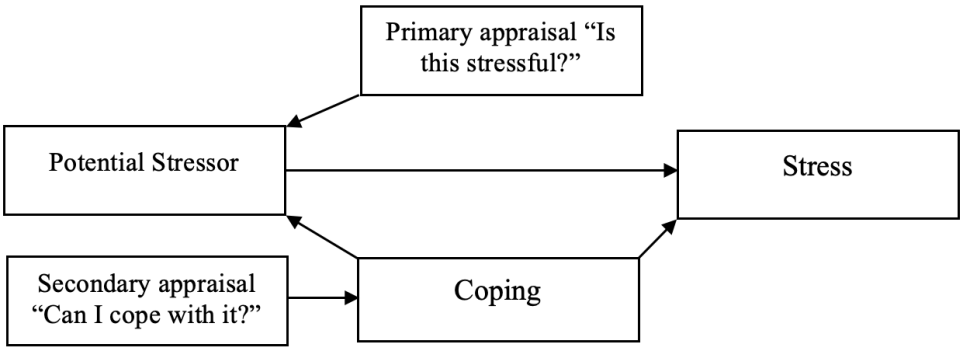

Figure 1. Lazarus and Folkman's (1987) model of stress appraisal (Ogden, 2022)

Building upon this foundation, the present study aims to measure the relationship between the health science students' level of stress and their levels of emotional intelligence in a preliminary research, and to propose a theoretically grounded intervention guided by Lazarus and Folkman's (1987) transactional stress appraisal theory and Mikolajczak's (2009) EI developmental model. Specifically, this study seeks to answer the following research questions: (1) Is there a statistically significant difference in EI levels among Health Sciences students experiencing varying levels of perceived stress?, and (2) How can an evidence-based EI training intervention be designed to reduce

stress and strengthen resilience among Health Sciences students in Vietnam? By addressing these questions, this research helps bridge a significant gap in Vietnamese higher education research. It offers a pathway to integrate EI training into health sciences curricula to support student mental health and professional development.

2. LITERATURE REVIEW

2.1. Ability Emotional Intelligence and Trait Emotional Intelligence

EI, as first proposed by Salovey and Mayer (1990), refers to the capacity to perceive, understand, regulate, and utilize emotions to guide cognition and behavior. In the Ability Model developed by Mayer and Salovey (1997), EI is conceptualized as a form of cognitive intelligence comprising four interrelated abilities: perceiving, using, understanding, and managing emotions. The Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT) operationalizes these components through performance-based tasks designed to measure how effectively individuals address emotion-related situations (Mayer et al., 2008). Within this framework, EI is treated as an objectively measurable ability that functions analogously to general intelligence, emphasizing accuracy in emotional reasoning and adaptability across contexts.

By contrast, the Trait Model proposed by Petrides and Furnham (2001) and further developed by Petrides et al. (2016) conceptualizes emotional intelligence as a constellation of emotion-related self-perceptions embedded within the broader personality structure. Trait EI reflects individuals' habitual emotional self-concepts - such as empathy, optimism, and emotional regulation - and is typically assessed using self-report measures, notably the TEIQue and the Emotional Quotient Inventory (EQ-i). Empirical studies, including Siegling et al. (2015), have demonstrated that TEIQue possesses incremental validity beyond the Big Five personality traits in predicting emotional and social outcomes, affirming its psychometric soundness and applied relevance in educational and psychological contexts.

Although Ability EI and Trait EI share conceptual foundations, they differ in their measurement approaches and predictive orientations. Ability EI captures maximal performance in emotion-related problem-solving, whereas Trait EI reflects typical emotion-related behaviors and self-evaluations. Critics have questioned the conceptual distinctiveness of EI, suggesting potential overlap with established personality constructs (Locke, 2005; Antonakis et al., 2009). Nevertheless, recent meta-analyses have substantiated the predictive validity of both constructs, indicating that they jointly contribute to individual differences in well-being, stress resilience, and adaptive functioning (Hodzic et al., 2018; Kotsou et al., 2018). Consequently, the two models are now regarded as complementary perspectives that enrich the understanding of emotional functioning rather than as competing paradigms.

2.2. Mikolajczak's Three-Level Model of Emotional Intelligence

Mikolajczak (2009) introduces the Three-Level Model of Emotional Intelligence, which integrates cognitive, behavioral, and dispositional dimensions of emotional functioning. The model conceptualizes emotional intelligence as a hierarchical structure comprising three interrelated tiers: knowledge, abilities, and dispositions.

At the knowledge level, EI involves the declarative understanding of emotional phenomena - knowing what emotions are, how they operate, and which strategies can effectively regulate them. This layer serves as the cognitive foundation for emotional understanding. The abilities level refers to the capacity to apply this knowledge in practice, translating conceptual understanding into effective emotional regulation and interpersonal competence. Examples include using cognitive reappraisal to manage stress or employing empathy in social interaction (Mikolajczak, 2009). The dispositions level encompasses enduring tendencies or propensities to behave in specific emotion-related ways, illustrating how emotional knowledge and skills are manifested in consistent behavioral patterns.

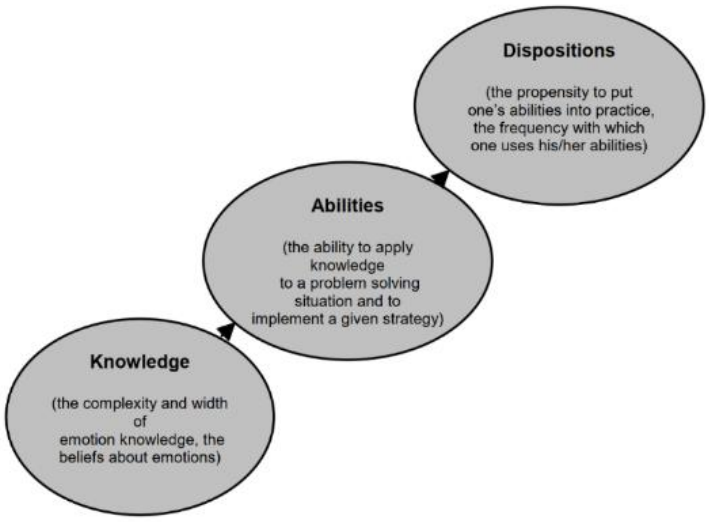

Figure 2. Mikolajczak (2009)'s Three-Level Model of Emotional Intelligence

This hierarchical model elucidates how cognitive awareness of emotions can be transformed into behavioral competence and ultimately into stable emotional dispositions. Importantly, it provides an integrative framework that bridges Trait EI and Ability EI, positioning *knowledge* and *abilities* as trainable and developmental components. At the same time, *dispositions* represent relatively stable outcomes of emotional learning and personality development (Campo et al., 2015). Through this synthesis, Mikolajczak's model offers a comprehensive perspective on how emotional intelligence evolves from understanding to action and enduring behavior.

2.3. Empirical Evidence and Educational Applications

Trait EI has attracted considerable scholarly interest due to its established association with stress regulation, psychological well-being, and adaptive coping. Empirical studies consistently show that individuals with higher Trait EI exhibit lower physiological stress reactivity and superior emotional regulation capacities. Petrides et al. (2016) and Mikolajczak et al. (2007) demonstrate that emotionally intelligent individuals exhibit reduced cortisol secretion in response to stress, underscoring the psychobiological mechanisms through which EI mitigates stress responses. These findings correspond with Lazarus and Folkman's (1984) Transactional Model of Stress and Coping, which highlights the mediating functions of cognitive appraisal and emotion regulation in adaptive stress management (Mikolajczak & Luminet, 2008).

Beyond psychological benefits, EI contributes to physical health and social adjustment. Kotsou et al. (2011) reported that EI-focused intervention programs led to a 14% reduction in daily cortisol levels and to improvements in indicators of social well-being. Similarly, Yalcin et al. (2008) found a 9.7% decrease in glycated hemoglobin levels among diabetic patients who received EI-based training. Collectively, these findings underscore emotional self-efficacy as a vital resource for strengthening coping mechanisms and enhancing resilience - an essential competency, particularly within healthcare education.

Empirical evidence also supports the efficacy of interventions developed based on Mikolajczak's (2009) Three-Level Model of Emotional Intelligence, which integrates emotional knowledge, abilities, and dispositions. Campo et al. (2015) demonstrated that EI training programs structured around this model significantly improved the participants' subjective well-being and reduced physiological stress markers such as cortisol levels, thereby validating the model's biopsychological grounding. Meta-analytic studies further reinforce these findings: Hodzic et al. (2017) synthesized evidence from 28 controlled studies and reported moderate yet consistent gains in EI, particularly when interventions prioritized emotion regulation and reflective learning. Extending this line of evidence, Kotsou et al. (2018) reviewed 46 EI intervention studies. They found that programs aligned with Mikolajczak's framework - especially those delivered face-to-face by trained facilitators - yielded the most enduring improvements in emotional regulation, stress management, and interpersonal functioning.

Applications of Mikolajczak's model within educational contexts have yielded similarly positive outcomes. Versel et al. (2023) implemented an EI–Resilience curriculum among second-year medical students and reported significant gains across all EI dimensions, including stress management and general well-being. These findings are consistent with earlier research by Mikolajczak et al. (2007) and Shahid et al. (2018), which revealed that emotionally intelligent medical trainees exhibited reduced physiological stress responses and greater resilience in clinical environments. Together, this growing body of evidence substantiates the effectiveness of interventions grounded in Mikolajczak's three-level model, demonstrating their potential to strengthen emotional competencies, stress-coping skills, and professional performance in healthcare education.

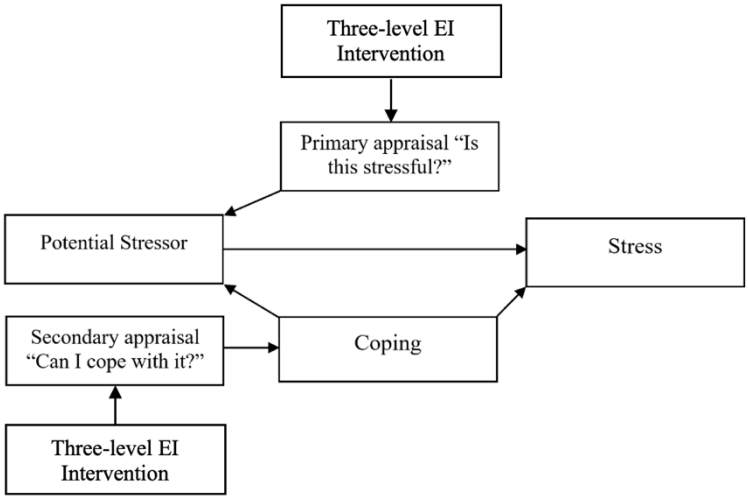

Figure 3. The proposed research model

Notes: *Integrating Lazarus and Folkman's (1984) Transactional Model of Stress and Coping with Mikolajczak's (2009) Three-Level Model of Emotional Intelligence offers a dynamic explanatory framework for understanding how emotional competencies influence appraisal and coping processes in stress regulation. Specifically, the model posits that emotional knowledge informs primary appraisal ("Is this situation stressful?"), emotional abilities guide secondary appraisal ("Can I cope with it?"), and emotional dispositions sustain long-term resilience and psychological balance. This synthesis situates emotional intelligence as both a mediating mechanism (influencing how stressors are interpreted and managed) and a modifiable resource (capable of enhancement through targeted training).*

In summary, EI encompasses two primary conceptualizations: Ability EI, which represents emotion-related cognitive skills (Mayer & Salovey, 1997), and Trait EI, which reflects self-perceived emotional functioning (Petrides & Furnham, 2001). Both have been consistently linked with psychological well-being and stress resilience (Hodzic et al., 2018; Kotsou et al., 2018). Mikolajczak's (2009) integrative Three-Level Model - comprising emotional knowledge, abilities, and dispositions - provides a cohesive theoretical foundation explaining how EI develops and can be systematically cultivated through training. Empirical evidence supports the effectiveness of interventions grounded in this framework in enhancing emotional regulation, alleviating stress, and fostering resilience (Campo et al., 2015; Versel et al., 2023). Within the lens of Lazarus and Folkman's (1984) model, EI is conceptualized as a multilevel adaptive system functioning through three mechanisms: enhancing emotional awareness (knowledge), facilitating adaptive coping (ability), and reinforcing resilience and well-being (disposition). Collectively, these interlinked processes establish EI as both a preventive and restorative mechanism in stress regulation, forming the conceptual foundation for the present study's methodological and intervention design.

3. MATERIALS AND METHODS

This section discusses the quantitative research methodology employed in the present study, which involves a cross-sectional survey design to establish baseline data on the EI and perceived stress levels of Health Sciences students at NTTU. The primary aim was to assess students' emotional competencies and stress experiences before the implementation of a structured EI intervention program. This baseline serves as a reference point for evaluating

the subsequent effectiveness of the training, ensuring that future changes in EI can be measured against a clearly defined empirical foundation.

Participants

The study population comprises students enrolled in Health Sciences programs at NTTU. Consistent with Lohr's (2021) sampling principles, a cluster sampling technique was applied for practical suitability within the institutional setting. Clusters were defined as intact academic classes, thereby allowing the inclusion of all students who would later participate in the EI intervention. The selected classes were purposively chosen, as they corresponded to the cohorts designated for forthcoming training sessions. All students present during data collection were invited to participate voluntarily.

Eligibility criteria required participants to be officially enrolled in one of the Health Sciences classes included in the intervention. Exclusion criteria were applied to respondents who failed to complete the questionnaire or exhibited invariant response patterns (e.g., selecting identical responses throughout), as such data were deemed invalid. Prior to statistical analysis, all datasets were screened to ensure accuracy and reliability.

Instrumentation

Data were collected using a questionnaire comprising demographic items and two standardized scales. Trait EI is assessed using the 30-item Trait EI Questionnaire–Short Form (TEIQue-SF, v. 1.50), a self-report instrument developed by Petrides (2001). The scale was selected based on its established reliability, incremental validity in predicting emotional reactivity, and successful application across diverse educational and clinical contexts (Mikolajczak, 2009; Kotsou et al., 2011; Abe et al., 2013; Petrides et al., 2010; Andrei et al., 2016; Kotsou et al., 2018). In the present study, the TEIQue-SF demonstrates satisfactory internal consistency (Cronbach's $\alpha = 0.827$), exceeding the recommended threshold of 0.7 (Hair et al., 2019).

The respondents rated the items on a 7-point Likert scale (1=Strongly Disagree to 7=Strongly Agree). The TEIQue-SF assesses the four primary domains of trait EI. These include Well-being, which concerns happiness, optimism, and life satisfaction; Self-control, which measures the ability to regulate emotions, cope with stress, and control impulses; Emotionality, encompassing the capacity to perceive and express one's own feelings; and Sociability, which focuses on social awareness and skills in managing relationships. Based on the average scores, EI levels were categorized as low (0.00–2.99), medium (3.00–4.99), or high (5.00–7.00).

The Perceived Stress Scale (PSS), developed by Cohen et al. (1983) and grounded in the Transactional Model of Stress proposed by Lazarus and Folkman (1984), is a widely used self-reporting instrument designed to measure the degree to which individuals perceive their lives as unpredictable, uncontrollable, and overwhelming. The PSS evaluates one's subjective experience of stress over the past month by asking how often respondents felt or thought in specific ways, using a five-point Likert scale ranging from 0 (never) to 4 (very often). The ten-item questionnaire includes both negatively and positively worded items, with four items (Questions 4, 5, 7, and 8) reverse-scored to account for positive coping and self-efficacy.

After reverse-scoring the relevant items, all responses are summed to produce a total score ranging from 0 to 40, with higher scores indicating greater perceived stress. PSS results are commonly interpreted as low (0–13), moderate (14–26), or high (27–40).

Table 1. Reliability analysis for EI and PSS scale

	Cronbach's Alpha
Trait EI	0.827
Wellbeing	0.785
Self-control	0.742
Sociability	0.729
Emotionality	0.803
Perceived Stress Scale	0.774

Data Analysis

Quantitative data were analyzed using IBM SPSS Statistics, Version 29.0.2.0. Descriptive statistics (frequencies, means, and standard deviations) were computed to summarize participants' demographic characteristics, EI levels, and perceived stress scores.

To determine whether Trait EI differed across levels of stress, a one-way analysis of variance (ANOVA) was performed. This statistical test was appropriate for comparing a continuous dependent variable (EI score) across categorical independent groups (stress levels). Before conducting the ANOVA, the assumptions of normality and homogeneity of variance were verified to ensure robust results. The hypotheses were formulated as follows:

Null Hypothesis (H_0): There is no statistically significant difference in Trait EI across students experiencing different levels of perceived stress.

Alternative Hypothesis (H_1): There is a statistically significant difference in Trait EI across students experiencing different levels of perceived stress.

The results of this analysis establish the empirical basis for the subsequent Emotional Intelligence Intervention Program, providing critical insights into the emotional and psychological profile of Health Sciences students prior to training implementation.

4. RESULTS AND DISCUSSIONS

4.1. Results of Emotional Intelligence Pre-intervention Assessment

The results of the pre-intervention assessment indicate that the overall EI of the Health Sciences students was moderate, with an average composite mean of 4.479 (SD = 0.713). This level suggests that, before the intervention, the students demonstrated an average ability to recognize, understand, regulate, and apply emotions effectively in academic and interpersonal contexts. Among the EI dimensions, Well-being recorded the highest mean (M = 4.960; SD = 1.024), followed by Emotionality (M = 4.425; SD = 0.793), Sociability (M = 4.188; SD = 0.902), and Self-control (M = 4.155; SD = 0.875), as shown in Table 2.

Table 2. Descriptive Statistics of Surveyed Health sciences students

	N	Minimum	Maximum	Mean	SD
Trait EI Results	100	2.367	6.500	4.479	0.713
Wellbeing	100	2.333	7.000	4.960	1.024
Self-control	100	2.000	6.167	4.155	0.875
Sociability	100	1.500	7.000	4.188	0.902
Emotionality	100	2.625	6.625	4.425	0.793

Further analysis examined variations in EI across academic year, gender, and household income, as summarized in Table 3.

Table 3. Component Analysis of Health sciences students' EI

Participants' Information (Percentages)		**Mean value**				
Number of participants (N = 100)	Percentages	Trait EI	Wellbeing	Self-control	Sociability	Emotionality
Current year of study	Year 2 (51%)	4.405	4.873	4.082	4.219	4.355
	Year 3 (6%)	4.261	4.805	4.056	3.806	4.333
	Year 4 (17%)	4.410	5.059	3.774	4.186	4.228
	Year 5 (24%)	4.729	5.139	4.646	4.208	4.677
	Year 6 (2%)	4.617	4.667	3.667	4.333	5.125

Genders	Female (57%)	4.544	4.977	4.114	4.292	4.520
	Male (38%)	4.382	4.943	4.237	3.996	4.316
	I wish not to say (5%)	4.473	4.900	4.000	4.467	4.175
Household Income Per Capita	Less than US$80 per month (7%)	4.081	4.476	3.809	3.690	4.196
	US$81 - US$120 per month (10%)	4.213	4.250	4.183	3.917	4.150
	US$121 - US$480 per month (51%)	4.478	4.899	4.245	4.281	4.387
	More than US$480 per month (32%)	4.650	5.385	4.078	4.234	4.621

The findings reveal distinct patterns in emotional intelligence (EI) across different demographic groups. Fifth-year students achieved the highest mean scores in Well-being (M = 5.139), Self-control (M = 4.646), and Emotionality (M = 4.677), indicating greater emotional stability and resilience developed through prolonged academic experience. In contrast, sixth-year students reported strong Emotionality (M = 5.125) but lower Self-control (M = 3.667), which may reflect the stress and uncertainty associated with graduation and career transitions.

Gender comparisons showed that the female students exhibited higher overall EI, particularly in Sociability (M = 4.292) and Emotionality (M = 4.520), reflecting stronger interpersonal sensitivity and empathy. Conversely, the male students scored slightly higher in Self-control (M = 4.237), suggesting a tendency toward emotional regulation and restraint.

Socioeconomic status also influenced EI outcomes. The students from higher-income households (earning above US$480 per month) reported the highest Well-being (M = 5.385) and Emotionality (M = 4.621), suggesting that financial security may contribute to psychological balance and emotional well-being. Meanwhile, those from lower-income families (earning below US$80 per month) exhibited the lowest Sociability (M = 3.690) and Well-being (M = 4.476), indicating that economic hardship can limit social engagement and emotional stability.

Overall, these findings suggest that both academic experience and socioeconomic context shape emotional intelligence among Health Sciences students. The students with greater academic maturity or stable economic conditions tend to display higher well-being and emotional awareness. This supports the theoretical link between emotional competence, stress management, and adaptive learning behaviors. These baseline results provide an essential foundation for evaluating the effectiveness of future EI intervention programs.

4.2. Description of Students' Perceived Level of Stress

Table 4. NTTU Health Science students' Perceived Level of Stress

			Total (N = 100)	**PSS Mean**	**SD**	**Min**	**Max**
Perceived stress score (PSS)	Stress group	Low stress (0 – 13)	35	10	2	5	13
		Moderate stress (13 -26)	54	17	3	14	24
		High stress (27 – 40)	11	30	2	27	35

Among the 100 Health Sciences students who completed the Perceived Stress Scale (PSS), the majority (54%) reported moderate levels of perceived stress (M = 17, SD = 3). Approximately 35% of the participants experienced low stress (M = 10, SD = 2), while 11% reported high stress (M = 30, SD = 2). The overall distribution of scores

(ranging from 5 to 35) demonstrates a transparent gradient across stress levels, indicating variability in how students appraise and manage academic and emotional demands.

The predominance of students within the moderate stress category aligns with existing findings in health education research, where continuous exposure to intensive academic tasks and clinical training environments often contributes to elevated stress perceptions. Although only a small proportion of the participants fell into the high-stress range, this subgroup nonetheless represents a potentially vulnerable population requiring attention in future emotional support initiatives.

In summary, descriptive results reveal that most Health Sciences students experience moderate perceived stress, suggesting a meaningful need for preventive and developmental interventions - such as structured EI training or stress management programs - to strengthen adaptive coping skills and maintain psychological well-being before professional practice.

4.3. Results of ANOVA Analysis of Nguyen Tat Thanh University Health Science Students' Emotional Intelligence Score among different Stress Groups

To examine whether the students' perceived stress levels were associated with differences in emotional intelligence (EI), a one-way analysis of variance (ANOVA) was conducted. The study aimed to determine whether statistically significant differences existed in mean Trait EI scores among the students in three distinct stress categories based on their Perceived Stress Scale (PSS) scores: Low Stress (n = 35), Moderate Stress (n = 54), and High Stress (n = 11).

Table 5. Students by Stress Group and Trait EI Score

Stress Group	N	EI Mean	SD	Min	Max
Low stress	35	4.969	.714	3.800	6.500
Moderate stress	54	4.342	.468	3.033	5.233
High stress	11	3.594	.578	2.367	4.500
Total	100	4.479	.713	2.367	6.500

Before conducting the ANOVA, the data were screened to verify compliance with statistical assumptions. Visual inspection of histograms revealed approximately normal distributions across groups, with mean and median values closely aligned, indicating normality. Levene's Test for equality of variances was non-significant ($p > .05$), confirming the assumption of homogeneity of variance.

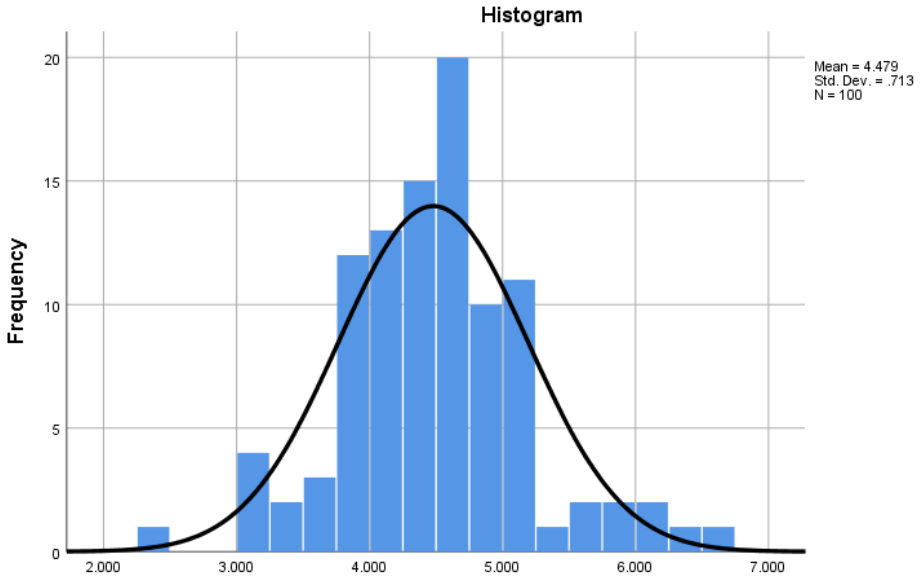

Figure 4. Histogram of Trait EI Score

The descriptive statistics indicated systematic differences in mean Trait EI across stress groups. The students in the Low Stress group obtained the highest average EI score (M = 4.97, SD = 0.71), followed by those in the Moderate Stress group (M = 4.34, SD = 0.47), while the High Stress group reported the lowest mean (M = 3.59, SD = 0.58). The results illustrate a clear decreasing trend in EI corresponding with higher stress levels.

After confirming all test assumptions, the one-way ANOVA yielded a statistically significant difference in Trait EI across the three stress groups, $F(2, 97) = 27.041$, $p < .001$. Post hoc comparisons using Tukey's HSD test indicated that all pairwise group differences were significant at the 0.05 level. Specifically, the students in the Low Stress group scored significantly higher than those in both the Moderate Stress (mean difference = 0.63, $p < .001$) and High Stress groups (mean difference = 1.37, $p < .001$). Additionally, the Moderate Stress group outperformed the High Stress group (mean difference = 0.75, $p < .001$).

Taken together, these results underscore that emotional intelligence levels differ significantly according to students' perceived stress levels. The inverse relationship between Trait EI and stress supports the theoretical proposition that emotional intelligence contributes to stress regulation and adaptive coping, allowing individuals to manage emotional and cognitive demands more effectively within academic and clinical environments.

4.4. Proposal for the Three-Level Emotional Intelligence Intervention Program

The proposed EI Intervention Program for Health Sciences students at NTTU is grounded in the empirical findings of this study, which demonstrated a statistically significant association between EI and stress regulation. The ANOVA results revealed apparent differences in Trait EI scores among students in low-, moderate-, and high-stress groups, as measured by the Perceived Stress Scale (PSS). These data provide quantitative justification for implementing an EI-based training program designed to enhance students' emotional competencies, particularly for those exhibiting moderate to high levels of stress. The observed inverse correlation between EI and perceived stress supports the theoretical assumption that emotional intelligence functions as a protective factor, enabling individuals to manage psychological strain and maintain mental well-being (Mikolajczak et al., 2009; Kotsou et al., 2018; Hodzic et al., 2018).

The intervention program is designed as a comprehensive, evidence-based initiative comprising three interconnected phases: a pre-intervention assessment, a 2.5-day intensive training workshop, and a one-month online follow-up phase. The program's conceptual foundation draws upon Mikolajczak's (2009) Three-Level Model of Emotional Competences, which defines emotional intelligence as a construct encompassing knowledge, abilities, and dispositions. Consistent with Kirkpatrick's (1996) model for training evaluation, this program adopts a process-oriented approach that focuses not only on immediate learning outcomes but also on the sustainability of behavioral change. This ensures that improvements in emotional regulation, empathy, and interpersonal effectiveness extend beyond the training context and are reinforced in students' everyday academic and clinical experiences.

The pre-intervention phase employs the Trait EI Questionnaire–Short Form (TEIQue-SF; Petrides, 2010), a psychometrically validated self-report measure that demonstrated high internal consistency in this study (Cronbach's $\alpha = 0.827$). Each participant will receive an individualized feedback report identifying personal strengths and areas for development, especially in emotion regulation and stress management - domains that differed significantly across stress levels in the baseline analysis. This phase cultivates self-awareness and sets individualized learning goals, aligning with the "knowledge" level in Mikolajczak's model and laying the cognitive foundation for emotional growth.

The core of the intervention consists of a 2.5-day intensive training workshop focused on developing five key emotional competencies: identifying, understanding, expressing and listening to, managing, and utilizing emotions to guide thought and behavior. The training integrates didactic instruction with experiential activities such as group discussions, role-play, reflective journaling, and case-based learning drawn from healthcare practice. This combination of cognitive and experiential learning aligns with Campo et al. (2015) and Kotsou et al. (2018), who found that blending behavioral practice with self-reflective learning significantly enhances emotional intelligence and resilience. Through these interactive modules, participants are expected to strengthen their capacity to recognize emotional cues, communicate empathically, and respond constructively to emotionally charged clinical situations, thereby improving both stress management and interpersonal effectiveness.

Following the workshop, participants will engage in a one-month online follow-up designed to reinforce and extend their learning. Bi-weekly reflective prompts will encourage students to apply emotional regulation strategies

in authentic academic and clinical contexts, emphasizing the identification of emotional triggers, the use of adaptive coping mechanisms, and maintaining emotional balance. A half-day review session at the end of the follow-up period will provide participants with opportunities to revisit key concepts, exchange experiences, and consolidate emotional self-regulation strategies. This design adheres to Kirkpatrick's (1996) principle that reinforcement and practice are crucial for sustaining long-term behavioral change.

The evaluation of program effectiveness will employ a multi-method approach integrating both quantitative and qualitative assessments. The TEIQue-SF will be administered again immediately after the intervention, one month later, and one year post-training to measure short- and long-term changes in Trait EI. In addition to quantitative data, qualitative feedback - including self-reflections, peer evaluations, and faculty observations - will be collected to assess the practical transfer of emotional competencies. Ethical standards regarding confidentiality, voluntary participation, and minimal risk will be strictly observed throughout the process, and the study will qualify for Institutional Review Board exemption.

The program is expected to yield measurable increases in Trait EI scores, particularly among students in the moderate- and high-stress groups identified in the baseline assessment. These gains are anticipated to correspond to reductions in perceived stress and improvements in emotion regulation, resilience, and psychological well-being, consistent with prior studies (Mikolajczak et al., 2009; Hodzic et al., 2018; Versel et al., 2023). Moreover, enhanced emotional intelligence is likely to foster positive secondary outcomes such as improved communication, teamwork, empathy, and patient interaction skills, all of which are critical for effective healthcare education and practice. By integrating empirical evidence, theoretical grounding, and systematic evaluation, this intervention provides a scientifically robust framework for developing emotionally intelligent, resilient, and empathetic healthcare professionals who are better equipped to manage the emotional demands of their academic and clinical environments.

5. CONCLUSION

This study investigates the relationship between emotional intelligence (EI) and perceived stress among Health Sciences students at NTTU, providing empirical evidence for the pivotal role of EI in managing psychological strain within academic and clinical learning environments. The analysis identified a significant inverse relationship between EI and stress levels, with students in the low-stress group exhibiting substantially higher Trait EI scores than their moderate- and high-stress counterparts ($F(2, 97) = 27.041$, $p < .001$). These findings confirm that emotional intelligence operates as a key psychological resource in stress regulation, reinforcing its theoretical and practical relevance in higher education. They also provide a data-driven rationale for implementing structured EI intervention programs to enhance emotional competence, resilience, and adaptability among healthcare students. Grounded in Mikolajczak et al.'s (2009) integrative model of emotional competencies, the proposed intervention emphasizes the development of emotional knowledge, skills, and dispositions as interconnected capacities essential for coping with stress and sustaining emotional well-being in professional practice.

While the study offers meaningful contributions, several limitations should be acknowledged. The first concerns the relatively small sample size (N = 100) and the study's focus on a single institution, which may limit the generalizability of the results. Future research should therefore employ larger and more diverse samples drawn from multiple universities to validate the observed patterns across different educational contexts. Second, reliance on self-reporting instruments introduces potential bias related to social desirability or self-perception, potentially influencing the accuracy of reported EI and stress levels. Incorporating multi-informant evaluations - such as peer assessments, instructor ratings, or behavioral observations - would strengthen the construct validity of future studies. Third, the cross-sectional design limits the ability to infer causality, preventing conclusions about the temporal direction of the relationship between EI and stress. Accordingly, longitudinal and experimental studies are recommended to examine developmental trajectories of emotional intelligence and to evaluate the sustained effects of EI training programs over time.

From a theoretical standpoint, this study contributes to the expanding literature on emotional intelligence and stress management in higher education, particularly within health sciences disciplines where emotional regulation is crucial for effective learning and clinical performance. In practice, the findings underscore the need to embed EI education into health sciences curricula to cultivate the emotional capacities required for professional competence and well-being. Future research should extend this work through longitudinal or intervention-based designs that empirically assess the effectiveness of the proposed three-level EI program. Employing pre- and post-intervention

measures, along with behavioral and academic indicators, would provide more robust evidence of causal relationships and the long-term benefits of EI enhancement.

In conclusion, by addressing these methodological considerations and expanding the empirical scope, subsequent studies can deepen understanding of how structured EI education fosters resilience, mitigates stress, and strengthens emotional adaptability among students and professionals in the health sciences. Such evidence will not only inform the development of more effective educational interventions but also contribute to a broader framework for promoting psychological well-being and professional excellence in healthcare education.

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