

## Effect of Emotional Intelligence Training Program on Stress and Self-Efficacy among Nursing Students

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### Abstract

**Background:** Emotional intelligence (EI) has been suggested as a protective factor for stress, while low EI is associated with a decline in self-efficacy (SE). **Aim of study:** to evaluate the effect of emotional intelligence training program on stress and self-efficacy among nursing students. **Design:** An open-label one group quasi-experimental study design with pre-post assessment was used to achieve the aim of the study. **Setting:** The study was conducted at the Faculty of Nursing affiliated to the Modern University for Technology and Information (MTI) in Cairo. **Subject:** A fixed stratified random sampling technique was used in recruiting students from the two selected levels. Thus, 75 students were recruited from each of the Levels I and IV. **Tools** A self-administered questionnaire was used comprising Schutte Self Report Emotional Intelligence Test [SSEIT]), Perceived Stress Scale, and Perceived Self-Efficacy Scale. The researcher prepared and implemented the EI program and evaluated its effect immediately and after 3 months. **Results:** Nursing students' median age was 20.5 years, with 51.3% males, with no previous training in EI (98.0%). There were significant increasing trends in EI scores, and decreasing trends in stress scores, with slight increases in SE. In multivariate analysis the study intervention was a positive predictor of EI and SE scores, and in addition to the EI score it was a negative predictor of the stress score. **Conclusion:** The EI program is effective in improving nursing students' self-efficacy and relieving their stress. **Recommendations:** The study recommends more in-depth inclusion of the topic of EI in nursing. Studies of the effect of EI programs on nursing students' academic achievement and clinical performance are proposed.

**Keywords:** Emotional intelligence, Stress, Self-efficacy, Nursing students

### Introduction

Stress in nurses, studied extensively in recent decades, is an international phenomenon (Osorio-Spuler *et al.* 2023). Nursing is an emotionally demanding job, and this contributes to interactive stress and to the daily stress of nurses' work (Reverté-Villarroya *et al.*, 2021). Students attend college in environments that are unique, challenging, and often adverse, with nursing students' stress strongly related to academic performance. Nursing students are disproportionately affected compared with nonmedical undergraduates (Doyle *et al.*, 2021).

Nursing is a social and emotional discipline that requires effective relationships among health-care providers when administering care to patients, their families, and society in various situations, as soon as they need help (Mačijauskaitė and Riklikienė,

2020). Clinical training induces much stress on nursing students, especially in year I (Dugué *et al.*, 2021). The demands of nursing practice, such as facing death or illnesses, increasing workloads, time pressure, and disregard for hierarchy, trigger significant perceived stress in this professional field (Dugué and Dosseville, 2018; Gurková and Zeleníková, 2018). Emotional intelligence (EI) has been suggested as a protective factor for stress, anxiety, and depression (Zhang *et al.*, 2016). EI encompasses a person's ability to express emotions and recognize emotions in others, ultimately using this information to regulate psychological circumstances and behavior (Dugué *et al.*, 2021). To include this psychological determinant in training would promote adaptive functioning and resilience in stressful situations (Jiménez-Rodríguez *et al.*, 2022). Several studies included EI

characteristics as a criterion alternative to grade point averages and found that higher EI in student nurses was predictive of success in baccalaureate programs (*Mazzella-Ebstein et al., 2021*). Individuals having high EI are more capable of understanding, overseeing, and coping with stress. Students with a high degree of emotional intelligence (EI) may be more efficient at individual and academic levels as they can regulate their emotions better than others (*Mayer et al., 2016*). Individuals who are emotionally intelligent are not only conscious of their own feelings, but they also express compassion and an understanding of the sentiments of others around them (*Irjan et al., 2019*).

Students who are unable to manage and conquer their stress may experience negative repercussions, particularly emotionally, such as trouble motivating oneself, dissatisfaction over unfinished chores, a decline in self-efficacy, and other negative effects. (*Sudrajat et al., 2022*). Student self-efficacy is the degree to which students believe they can succeed academically, perform their assigned tasks competently, and have hope for the future. Self-efficacy is a measure of one's ability to make wise or foolish decisions and to carry them out. (*Gunawan et al., 2019*).

Emotional intelligence can facilitate the mechanism of coping with stress and provide the individual with an effective self-regulation system for coping with stress (*EsmailPour, 2016*). Emotional intelligence by managing employees' emotions and facilitating the exchange of positive emotions between them reduces the negative effects of job stress, making them resistant to early burnout when it has a two-way relationship with mental health (*Heydarifard et al., 2022*). Individuals with well-developed emotional intelligence possess many qualities that enhance their emotional and intellectual growth and decision-making (*Gratza, 2020*). Meanwhile, there is evidence that EI can be nurtured and developed. This type of intelligence is not a fixed measurement but can be developed throughout one's life (*Mattingly and Kraiger, 2019*).

Individuals who hold incremental theories of EI had better EI performance, which

could be explained by the fact that this type of theorist believes that EI can be changeable and, when facing new or difficult emotional experiences, were perhaps more likely to perceive such experiences as a necessary means of developing and acquiring new abilities (*Costa and Faria, 2023*). These results indicate that EI can play a role in students' academic achievement by reinforcing their perceptions of emotional competence, which in turn might foster their academic progress (*Costa and Faria, 2020*). These results also revealed that EI can have an effect on individual's self-regulatory processes (*Costa and Faria, 2023*).

### **Significance of the study:**

The nursing profession can be regarded as a difficult profession because of the fact that it requires making vital decisions, with possible negative feelings during this process. Nursing students need to have advanced problem-solving skills so as to be able to cope with such negative emotions. Given the importance of the role of emotions in students' adaptation to their educational trails, more research was done to increase the application of EI in academic venues. Nonetheless, although some research work demonstrated the relation between EI and positive learning outcomes, there is still a paucity of research, and it is mostly based on observational designs.

### **Aim of the study:**

This study aims to evaluate the effect of emotional intelligence training program on stress and self-efficacy among nursing students.

#### **Research hypotheses**

1. The implementation of an emotional intelligence program will lead to a significant increase in undergraduate nursing students' self-efficacy.

2. The implementation of an emotional intelligence program will lead to a significant decrease in undergraduate nursing students' stress.

#### **Subject & Methods:**

##### **Research Design**

An open-label one group quasi-experimental study design with pre-post

assessment was used to achieve the aim of the study.

#### **Setting:**

The study was conducted at the Faculty of Nursing affiliated to the Modern University for Technology and Information (MTI) in Cairo. The faculty has six departments, namely medical-surgical, pediatric, obstetric, psychiatric, community health nursing departments, in addition to the nursing administration department.

#### **Subjects:**

A fixed stratified random sampling technique was used in recruiting students from the two selected levels. Thus, 75 students were recruited from each of the Levels I and IV.

#### **Tools of data collection:**

The data required to achieve the aim of this study were collected using a self-administered questionnaire with standardized scales measuring emotional intelligence, stress, and self-efficacy. The questionnaire thus comprised the following parts.

▪ *Part I:* This part was used for collection of the nursing student's demographic data such as age, gender, marital status, parents' education and mother job, place of residence, crowding index, and family income. It also included health-related data such as chronic diseases, disability, smoking, sporting, hobbies, and the number of friends, as well as the perception of own health. Academic-related data were also sought such as the year level, type of pre-university education, having personal computer and access to internet, previous training in emotional intelligence, GPA, and previous academic failure.

▪ *Tool I:* Schutte Self Report Emotional Intelligence Test (SSEIT): This 33-item self-report scale was developed by *Schutte et al. (1998)* to measure emotional intelligence. It assesses four dimensions of EI, namely Perception of Emotion, Managing own Emotions, Managing others' Emotions, and Utilization of Emotion. A validated Arabic version was used. It has documented construct

validity and high reliability with Cronbach's alpha coefficient 0.908 (*Zoghiami et al., 2022*).

*Scoring:* The responses are on a five-point Likert scale from "strongly agree" to "strongly disagree." These are scored from one to five with reverse scoring to items 5, 28 and 33. The total score ranges from 33 to 165, with higher scores indicating higher EI. The scores of each dimension and of the total scale were converted into percentage scores. The respondent's EI was considered "High" if the total percentage score was 60% or higher, and "Low" if less than 60%.

▪ *Tool II:* This consists of the Perceived Stress Scale originally developed by *Cohen et al. (1983)* and adopted from *Eltrass et al. (2022)*. This 10-item tool is the most widely used psychological instrument for measuring the perception of stress. It assesses the degree to which situations in one's life are considered stressful. Its items are designed to gauge how unpredictable, uncontrollable, and overloaded respondents find their lives. The content validity of the tool was tested by five experts in Psychiatric Mental Health Nursing in Ain Shams University. It has a high reliability with Cronbach's alpha coefficient 0.908 (*Eltrass et al., 2022*).

*Scoring:* The responses are on a 5-point Likert scale from "never" to "very often" according to the frequency at which the situation in the item is perceived as stressful. The responses are scored from 0 to 4, respectively. The scoring is reversed for the four positively stated items (items 4, 5, 7 & 8). The scores of the ten items are summed to yield a total score ranging from 0 to 40, with higher scores indicating more perceived stress.

▪ *Tool III:* This consisted of the Perceived Self-Efficacy scale, used to assess nursing student's perception of self-efficacy. It was originally developed by *Alwan (2013)* and the researcher adopted it from *Ibrahim et al. (2020)*. The tool has 39 items categorized under five dimensions such as emotional, social, *Insistence/Persistence*, *Cognitive*, and *Academic dimention*.

**Scoring:** The response to each item was on a 5-point Likert scale from “*strongly disagree*” to “*strongly agree*.” These were scored from 1 to 5 respectively, with reverse scoring for negative items. The scores of each dimension and for the total scale were summed-up and converted into percentage scores. The student was considered to have high self-efficacy if the score was 60% or more and low if <60%.

### Procedure:

#### The actual study included three phases: Preparatory phase

In this phase, the researcher reviewed current and past, local, and international related literature to gain in-depth knowledge of the different aspects of the study topics. This was achieved using textbooks, articles, scientific journals, and internet search. This helped in the selection and preparation of the data collection tool and in writing-up the scientific background of the study.

**Tools validity and reliability:** The scales used in this study are standardized with proven validity and reliability (Zoghalmi et al., 2022; Eltrass et al., 2022; Ibrahim et al. 2020).

Moreover, the reliability of the scales used in the tool was measured through assessing their internal consistency. They demonstrated good reliability levels as shown below.

Scales	N of Items	Cronbach's Alpha
Emotional intelligence	33	0.843
Stress	10	0.795
Self-efficacy	39	0.610

### Pilot study:

A pilot study was carried out on students from other levels/semesters representing 10% of

the main study sample. The aim was to test the clarity and applicability of the data collection forms, the feasibility of the study, and to estimate the time needed for filling in the forms. Necessary modifications were made according to the results of the pilot study. These students were not included in the main study sample.

### Ethical consideration:

An approval of the study protocol was obtained from the Nursing Research Ethics Committee in the Military Medical Academy. In addition, the researcher met with the Dean of Faculty of Nursing, MTI University to explain the aim of the study and its procedures. All students were informed that participation in the study was voluntary, and that the collected data would be treated confidentially, and that the anonymity of each participant would be assured by the allocation of a code number to the questionnaire form. They were also informed that any obtained information will be used exclusively for the research purpose. Each participant was also informed that she/he has the right to withdraw from the study at any time without giving any reason.

### Fieldwork

The research was conducted through assessment, planning, implementation, and evaluation phases.

**Assessment Phase:** After securing the official approvals for conducting the study, the researcher met with the nursing students to explain the aim of the study and the data collection procedure. They were handed the forms to fill them in after obtaining necessary instructions. This was done individually, and the researcher was present all the time to respond to any queries and to avoid any communication among students during the filling process. Then, the researcher collected the filled forms and checked for their completeness. The collected data were considered as baseline or pretest data.

**Planning phase (Program Design):** In this phase, the researcher prepared the EI program based on the students' needs identified

from the analysis of the baseline data and in view of the related literature. The program main goal was to improve nursing students' emotional intelligence which is expected to have a positive impact on their self-efficacy and reduce stress.

The program was designed with its main aim, objectives, content, methods of teaching, places of training and teaching aids. It consisted of 12 theoretical hours over a period of 4 weeks. The topics covered in the program included an introduction to emotional intelligence, its components, distress tolerance, problem-solving, empathy and compassion, communication skills, teamwork and collaboration, and stress management.

**Implementation phase:** The program was implemented in small groups of students. Adult learning principles were used to enhance the learning process. Each group had two sessions per week. Sessions included mini-lectures, group discussions, interactive discussion, clinical examples, and role playing. The teaching media used included data show, videos, and flipchart.

The program was implemented over a period of 4 weeks, with 8 sessions for each group. The sessions were on Wednesdays or Thursdays. The duration of each session was about 90 minutes from 9:00 am to 10:30 am. The implementation phase lasted from May to June 2023.

**Evaluation phase:** Upon completion of the program implementation, the same data collection tools used in the pretest were applied as an immediate posttest to assess the effectiveness of the program. This was repeated after 3 months to measure the retention and long-term effectiveness of the program.

### **Statistical analysis:**

Descriptive statistics were used to present data as frequencies and percentages for qualitative, and means, standard deviations and medians for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the scales used through measuring

their internal consistency. Analytic statistics included chi-square tests for comparing categorical variables, and Spearman's rank correlation for the relations among quantitative and ranked variables. Multiple regression analysis was used to identify the independent predictors of the scores of emotional intelligence, stress, and self-efficacy at both pre-intervention and post-intervention phases. The level of statistical significance was set at p-value <0.05. All analyses were performed on SPSS 20.0 statistical package.

### **Results:**

As shown in Table 1. The study sample consisted of 150 nursing students whose age ranged between 18 and 26 years, median 20.5 years, with a slight preponderance of males (51.3%) as shown in Table 1. The majority were single (86.7%), living in households with crowding index less than two persons per room (81.3%). Their parents' education was mostly secondary or higher levels.

Figure 1 summarizes the changes in Level "1" nursing students' emotional intelligence (EI), stress, and self-efficacy. It points to an increasing trend in their scores of EI, and a decreasing trend of their stress scores, while their scores of self-efficacy tended to be stable throughout the intervention.

Table 2 describes nursing students academic characteristics. It shows that the majority had general pre-university education (89.3%), had a personal computer (65.3%), and almost all of them had access to the internet (98.7%), but had no previous training in EI (98.0%). Only 8.0% reported having previous academic failure, and approximately two-thirds of them (62.7%) had a "very good" GPA academic grade.

Figure 2 recaps the changes in Level "4" nursing students' emotional intelligence (EI), stress, and self-efficacy. It demonstrates an increasing trend in their scores of EI, and a decreasing trend of their stress scores. Meanwhile, their scores of self-efficacy tended to be stable throughout the intervention.

Table 3 points to statistically significant improvements in Level “1” nursing students’ emotional intelligence, reaching statistical significance at the FU phase of the intervention ( $p=0.005$ ). Their self-efficacy was generally high at the pre-intervention phase with the exception of the emotional self-efficacy (57.3%). Their total self-efficacy had an increasing trend throughout the intervention phases rising from 85.3% at the pre-intervention to 90.7% at the FU phase, although with no statistical significance ( $p=0.32$ ). Meanwhile, their high stress significantly dropped from 36.0% at the pre-intervention phase to 14.7% at the FU phase ( $p=0.003$ ).

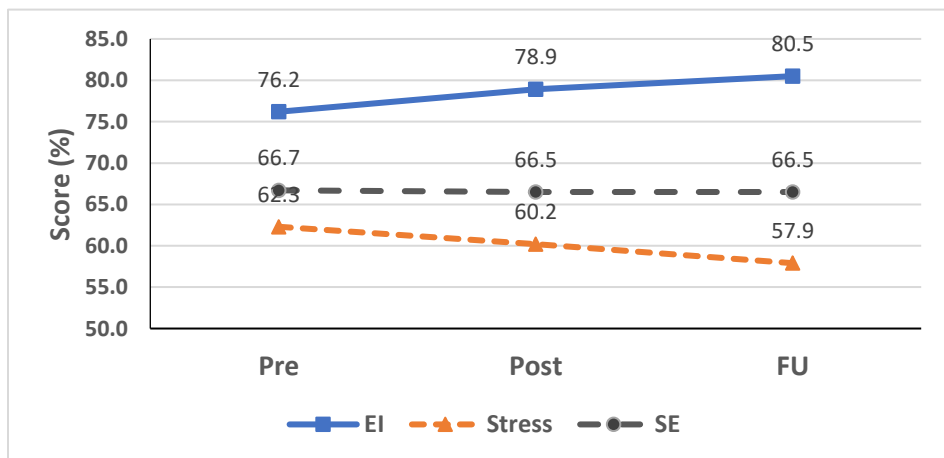
Figure 3 describes the changes in nursing students’ emotional intelligence (EI), self-efficacy, and stress throughout the intervention. It shows an increasing trend in their EI scores, and a decreasing trend in their stress scores. Meanwhile, their scores of self-efficacy tended to be stable throughout the intervention.

As for Level “4” students, Table 4 demonstrates statistically significant improvements in their emotional intelligence, reaching statistical significance at the post and FU phases of the intervention ( $p=0.03$ , and  $p=0.005$ ). Their pre-intervention self-efficacy was variable ranging between 57.3% for the emotional self-efficacy and 92.0% for the cognitive self-efficacy. Their total self-efficacy had an increasing trend throughout the intervention phases rising from 85.3% at the pre-intervention to 94.7% at the FU phase, with borderline statistical significance ( $p=0.06$ ). On the other hand, their high stress levels significantly decreased at the post-intervention ( $p=0.002$ ) and FU ( $p<0.001$ ) phases.

Table 5 indicates a statistically significant moderate negative correlation between nursing students’ scores of stress and EI ( $r=-0.443$ ). Meanwhile, a statistically significant weak positive correlation ( $r=0.184$ ) was found between their scores of EI and SE.

**Table 1: Demographic characteristics of students in the study sample (n=150)**

	Frequency	Percent
Age:		
<21	75	50.0
21+	75	50.0
Range	18-26	
Mean±SD	20.7±2.0	
Median	20.5	
Gender:		
Male	77	51.3
Female	73	48.7
Marital status:		
Single	130	86.7
Engaged	18	12.0
Married	2	1.3
Father education:		
Illiterate	10	6.7
Read/write	10	6.7
Basic	4	2.7
Secondary	58	38.7
University	68	45.3
Mother education:		
Illiterate	18	12.0
Read/write	3	2.0
Basic	5	3.3
Secondary	77	51.3
University	47	31.3
Crowding index:		
<2	122	81.3
2+	28	18.7



**Figure 1: Emotional intelligence, stress, and self-efficacy among Level 1 student**

Table 2: Academic characteristics of students in the study sample (n=150)

	Frequency	Percent
Pre-university education:		
General	134	89.3
Technical	16	10.7
Have personal computer:		
No	52	34.7
Yes	98	65.3
Have internet:		
No	2	1.3
Yes	148	98.7
Had previous training in EI:		
No	147	98.0
Yes	3	2.0
GPA:		
Good	13	8.7
Very	94	62.7
Excellent	43	28.7
Previous academic failure:		
No	138	92.0
Yes	12	8.0

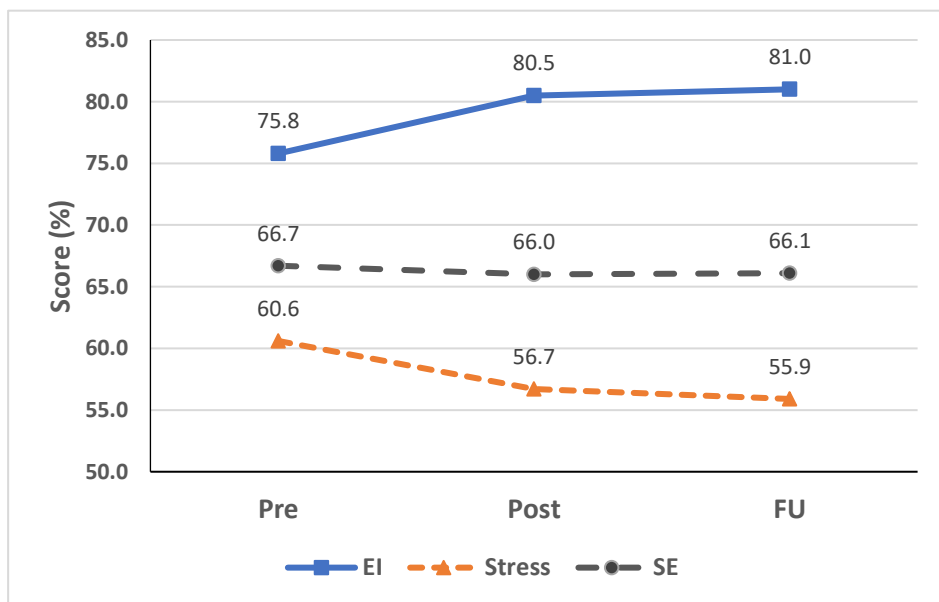


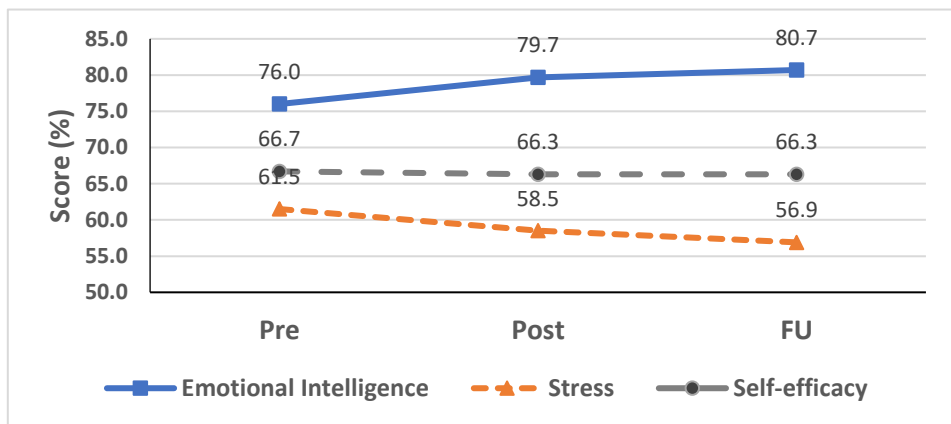
Figure 2: Emotional intelligence, stress, and self-efficacy among Level 4 students



**Table 3:** Level 1 students’ emotional intelligence (EI), stress, and Self-Efficacy (SE) throughout intervention phases

	TIME						X <sup>2</sup> (p) Pre-post	X <sup>2</sup> (P) Pre-FU
	Pre (n=75)		Post (n=75)		FU (n=75)			
	No.	%	No.	%	No.	%		
<b>EMOTIONAL INTELLIGENCE:</b>								
High	63	84.0	70	93.3	73	97.3	3.25	7.88
Low	12	16.0	5	6.7	2	2.7	(0.07)	(0.005*)
<b>SELF-EFFICACY</b>								
<b>Emotional:</b>								
High	43	57.3	45	60.0	43	57.3	0.11	0.00
Low	32	42.7	30	40.0	32	42.7	(0.74)	(1.00)
<b>Social:</b>								
High	67	89.3	69	92.0	69	92.0	0.32	0.32
Low	8	10.7	6	8.0	6	8.0	(0.58)	(0.58)
<b>Perseverance:</b>								
High	65	86.7	66	88.0	65	86.7	0.06	0.00
Low	10	13.3	9	12.0	10	13.3	(0.81)	(1.00)
<b>Cognitive:</b>								
High	66	88.0	71	94.7	72	96.0	2.11	3.26
Low	9	12.0	4	5.3	3	4.0	(0.15)	(0.07)
<b>Academic:</b>								
High	64	85.3	56	74.7	61	81.3	2.67	0.43
Low	11	14.7	19	25.3	14	18.7	(0.10)	(0.51)
<b>Total SE:</b>								
High	64	85.3	65	86.7	68	90.7	0.06	1.01
Low	11	14.7	10	13.3	7	9.3	(0.81)	(0.32)
<b>STRESS:</b>								
High	27	36.0	19	25.3	11	14.7	2.01	9.02
Low	48	64.0	56	74.7	64	85.3	(0.16)	(0.003*)

(\*) Statistically significant at  $p < 0.05$



**Figure 3:** Emotional intelligence, stress, and self-efficacy among all students

**Table 4: Level 4 students' emotional intelligence (EI), Self-Efficacy (SE), and stress throughout intervention phases**

	TIME						X <sup>2</sup> (p) Pre-post	X <sup>2</sup> (p) Pre-FU
	Pre (n=75)		Post (n=75)		FU (n=75)			
	No.	%	No.	No.	%	No.		
<b>EMOTIONAL INTELLIGENCE:</b>								
High	63	84.0	71	94.7	73	97.3	4.48	7.88
Low	12	16.0	4	5.3	2	2.7	(0.03*)	(0.005*)
<b>SELF-EFFICACY</b>								
<b>Emotional:</b>								
High	43	57.3	44	58.7	44	58.7	0.03	0.03
Low	32	42.7	31	41.3	31	41.3	(0.87)	(0.87)
<b>Social:</b>								
High	66	88.0	63	84.0	67	89.3	0.50	0.07
Low	9	12.0	12	16.0	8	10.7	(0.48)	(0.80)
<b>Perseverance:</b>								
High	66	88.0	70	93.3	68	90.7	1.26	0.28
Low	9	12.0	5	6.7	7	9.3	(0.26)	(0.60)
<b>Cognitive:</b>								
High	69	92.0	67	89.3	71	94.7	0.32	0.43
Low	6	8.0	8	10.7	4	5.3	(0.58)	(0.51)
<b>Academic:</b>								
High	56	74.7	57	76.0	57	76.0	0.04	0.04
Low	19	25.3	18	24.0	18	24.0	(0.85)	(0.85)
<b>Total SE:</b>								
High	64	85.3	67	89.3	71	94.7	0.54	3.63
Low	11	14.7	8	10.7	4	5.3	(0.46)	(0.06)
<b>STRESS:</b>								
High	23	30.7	8	10.7	5	6.7	9.15	14.23
Low	52	69.3	67	89.3	70	93.3	(0.002*)	(<0.001*)

(\*) Statistically significant at  $p < 0.05$

**Table 5: Correlation matrix of students' overall (n=450) scores of emotional intelligence (EI), stress, and self-efficacy (SE)**

	Spearman's rank correlation coefficient		
	EI	Stress	SE
Emotional intelligence (EI)	1.00		
Stress	-0.443**	1.00	
Self-Efficacy (SE)	0.184**	-0.024	1.00

(\*\*) Statistically significant at  $p < 0.01$

### Discussion:

The present study sample had nursing students with a wide age range since it included students from the first and fourth levels of academic grades. These extreme levels were chosen to be able to compare the effects of the educational intervention on the study outcomes among freshman and senior students given the effects of academic life exposures between the two levels. The gender and residence location were almost equally distributed in the sample. In this respect, the effect of age, and

consequently of the academic grade or level, on emotional intelligence has been demonstrated in a study in Spain (*Mon-López et al., 2023*).

The students in the current study sample seem to belong to the middle class according to their sociodemographic characteristics. Thus, the majority of them were living in households with a crowding index of less than two persons per room, with parents' mostly having secondary or higher levels of education, and with sufficient income. Also, most of the

students reported having a personal computer, and almost all of them had access to the internet. These characteristics could have influences on their emotional intelligence as well as their self-efficacy and experience of stress. In line with this, the influence of sociodemographic factors on nurses' emotional intelligence has been reported in a study in China (*Liu et al., 2023*).

The present study was aimed at improving self-efficacy among nursing students, and to reduce the level of stress among them. This would be attained through improving their emotional intelligence. The study results revealed that at the pre-intervention phase, the majority of students at both Level 1 and Level 4 had high emotional intelligence and high self-efficacy. This would make it more difficult for the intervention to effect significant improvements given these high baseline levels. The finding is in agreement with the study carried out by *Almansour (2023)*, where the majority of Saudi nursing students had moderate to high levels of emotional intelligence.

On the other hand, female gender was identified as a negative predictor of the nursing students' pre-intervention emotional intelligence score. In agreement with this, a study among nursing students in Saudi Arabia demonstrated that male students had higher scores in comparison with their female peers, and the difference was statistically significant (*Almansour, 2023*). Conversely, a study in China showed that female nursing students had significantly higher scores on emotional intelligence compared with male students (*Deng et al., 2023*). Such discrepancy could be attributed to differences related to study settings such as societal norms and gender-based differences and equity.

Conversely, female gender was identified as an independent positive predictor of nursing students' pre-intervention self-efficacy and stress scores. These could be attributed to the academic zeal often observed among female students, which would increase their sense of self-efficacy but at the same time raise their feelings of anxiety and stress. In congruence with this, a study in Palestine found

significantly higher levels of stress among female nursing students compared with males (*Bsharat et al., 2023*). However, previous studies in Pakistan (*Ashraf et al., 2023*), and Spain (*Arbinaga, 2023*) could not reveal a gender difference in students' self-efficacy.

This present study finding is in agreement with the results of a study in Palestine where significantly higher levels of stress were found in first year students compared with final year ones (*Bsharat et al., 2023*). However, in contradiction with this, a systematic review revealed higher levels of stress among final years' nursing students in comparison with freshman and sophomore ones (*Vo et al., 2023*). The difference could be attributed to different types of curricula and educational systems.

Concerning the factors influencing nursing students' pre-intervention stress score, the multivariate analysis identified their emotional intelligence score as the main negative predictor. The finding supports the rationale for the present study, which assumed that the improvement of students' emotional intelligence will lead to decreases in their stress levels. This is in congruence with the results of a study carried out among Spanish nursing students, where the emotional intelligence and stress scores were negatively and significantly correlated (*Rodríguez-Leal et al., 2023*).

The implementation of the present study intervention led to significant improvements in nursing students' emotional intelligence, and the improvement was maintained throughout the follow-up phase. These improvements were demonstrated among both Level 1 and Level 4 students. Such an improvement reflects the success of the intervention as demonstrated in the multivariate analysis where the study intervention was identified as the main independent positive predictor of nursing students' post-intervention EI score. More importantly, the improvement in students' emotional intelligence was essential for the intervention to have an impact on students' self-efficacy and stress as the study hypothesized.

In agreement with this foregoing present study finding, a similar improvement in Turkish

nursing students' emotional intelligence was reported following an educational program (*Öztürk, 2023*). On the same line, a study carried out in Italy demonstrated significant improvements in the scores of emotional intelligence among participants of a related training program (*Pauletto et al., 2023*).

Other factors affecting the current study nursing students' post-intervention emotional intelligence as identified in the multivariate analysis were their GPA and family income, which had a positive effect, and urban residence which had a negative effect. The positive effects of GPA and family income are expected. Meanwhile, the negative effect of urban residence reflects more benefits gained from those students with rural residence. In line with this, a study in Pakistan found a significant positive association between students' emotional intelligence and their academic performance and achievement (*Fatima, 2023*).

The first research hypothesis of the current study was that the implementation of an emotional intelligence program will lead to a significant increase in undergraduate nursing students' self-efficacy. The study results demonstrated improvements in students post-intervention self-efficacy, which reached statistical significance at the follow-up phase. The improvement was slow and small, which could be attributed to the high pre-intervention levels, where more than 85% of the students had high self-efficacy.

Nevertheless, the present study intervention had a significant and independent positive effect on students' self-efficacy scores as demonstrated in the multivariate analysis. Thus, the study intervention was identified as an independent positive predictor of nursing students' post-intervention self-efficacy score, and the model explained 30% of this improvement. This provides a positive answer to the first research hypothesis. In congruence with this, a study in Spain revealed significant improvements in nursing students' self-efficacy following a training program (*Ruiz-Fernández et al., 2023*).

Another factor with an independent positive influence on nursing students' self-

efficacy score was their perception of own health. This is very realistic since the individual who feels he/she is in good health is more likely to be convinced about his/her own physical and intellectual abilities. On the other hand, father education was a negative predictor of students' self-efficacy score. This might be explained by the fact that the students who have fathers with low level of education might be more independent and only depend on themselves, which could make them more self-efficacious. In this respect, the influence of family climate and functioning on next-generation's self-efficacy has been highlighted in a study in the United States (*Miller, 2023*).

The second present study research hypothesis was that the implementation of an emotional intelligence program will lead to a significant decrease in undergraduate nursing students' stress. The results revealed significant decreases in students' stress, which was demonstrated at both Level 1 and Level 4 students. The improvements were also maintained through the follow-up phase. These results provide a clear positive answer to the second research hypothesis. In agreement with this, a study in Iran demonstrated the effectiveness of a training program in emotional intelligence in alleviating nursing students' stress (*Khorasani et al., 2023*).

The improvement in the current study nursing students' stress is undoubtedly attributed to the implementation of the study intervention that was aimed at improving their emotional intelligence. Thus, the multivariate analysis demonstrated a direct and an indirect effects of the intervention on students' stress, where the intervention itself (direct effect) in addition to the emotional intelligence score (indirect effect) were identified as negative predictors of the post-intervention stress score. In line with this, a study on Moroccan nursing students demonstrated a negative correlation between their scores of emotional intelligence and level of stress, and the emotional intelligence score turned to be a negative predictor of their stress scores (*Ksiksou et al., 2023*).

In addition to the study intervention, two more factors were identified as significant

independent negative predictors of the present study nursing students' post-intervention stress score. These were students' perception of own health, and father education. The effect of father education could be explained by its positive influence on family functioning, which would alleviate students' daily home stressors. As for the perception of own health, as previously discussed, a good perception would have a positive impact on students' physical and mental health, which would help in coping with stress. In congruence with this, *Watson (2023)* in a study in the United States highlighted the direct relation between negative perception of health and the experience of stress among nursing students.

### Conclusion:

The study results lead to the conclusion that nursing students in the study settings have generally good emotional intelligence and self-efficacy, with relatively high level of stress. The implementation of the emotional intelligence program is effective in improving their self-efficacy and relieving their stress. The effect on stress is more prominent, and these effects are maintained through a follow-up period of three months.

### Recommendation:

In view of the study findings, the study recommends the following.

- *For education:*
  - The topics of emotional intelligence and critical thinking skills should be addressed in more depth in nursing schools/colleges' curricula.
  - Educational workshops and seminars with hands-on training should be conducted regularly for the nursing students to improve emotional intelligence skills.
  - Self-learning should be emphasized to promote nursing students' self-efficacy and attenuate their academic stress.
- *For management:*
  - A positive emotional intelligence atmosphere should be created in classrooms through empathy, healthy social dialogue, confidence, and recognition.
  - Open mutual communication between nursing teachers and students is recommended in order to facilitate expression of feeling and to

discuss the possible stressful situations that might happen.

- Periodic assessment of nursing students' academic stress with identification of underlying factors is needed to help in the relief of such stress.

- *For research:* The following are proposed:

- Study of the effect of implementation of an emotional intelligence program on nursing students' academic achievement.
- Study of the effect of emotional intelligence training on nursing students' clinical performance.

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