



Article

Learning Environments in Health and Medical Studies: The Mediating Role of Emotional Intelligence

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Abstract: The conventional approach to sustainability is being extended through approaches such as the psychology of sustainability and sustainable development. Under such approaches, the analysis of sustainability also involves understanding improvements in people's quality of life in environments such as education and learning. Based on this theoretical approach, this study explored the relationships between anxiety, emotional intelligence, and mechanisms for coping with stressful situations. The mediating role of emotional intelligence in the relationship between anxiety and coping mechanisms was also assessed. The anxiety, emotional intelligence, and coping variables were measured using standardized tests administered to students. This cross-sectional study was based on self-reports by health students at universities in Valencia (Spain). The study conformed to the ethical standards established by the Declaration of Helsinki. In total, 434 students participated in the study. The students were aged between 17 and 54 years (M = 21; SD = 0.320). From the perspective of the psychology of sustainability, the results indicate that avoidance coping strategies are positively related to anxiety and are negatively related to emotional intelligence. However, the results also show that approach coping strategies are positively related to emotional intelligence. In addition, the analysis shows the mediating role of emotional intelligence in the relationship between anxiety and coping. This study shows the need to encourage the sustainable development of emotional intelligence among health professionals and to consider this sustainable development when designing education programs for health-related fields.

Keywords: learning environments; anxiety; coping; emotional intelligence; health students

1. Introduction

The psychology of sustainability and sustainable development is helping to expand the traditional concept of sustainability. The conventional approach is limited to the environment, equity, and economics (the "three Es"). Under the psychology of sustainability, however, the concept of sustainability is broader, also covering the dimensions of psychology and health [1]. Broadly speaking, sustainability under this approach also consists of actions aimed at improving the well-being of people and preventing health problems such as anxiety and the use of inefficient coping strategies to deal with stressful situations in everyday life.

The psychology of sustainability and sustainable development involves the analysis of improvements in people's quality of life in different contexts and institutions [1–3] to encourage growth and sustainable development [4]. Accordingly, an institution's sustainability largely depends on the well-being of the members of that institution and its chances of prospering [2].

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In general, higher education students face uncertain situations that may involve an increase in stress or anxiety, or the use of ineffective coping strategies. More specifically, health students experience these risks to a greater degree because of the nature of their course material and practical studies in natural contexts. Notably, ensuring people's health and well-being is one of the objectives proposed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Health Organization (WHO) to achieve a high quality of life and the transition from illness to good health [5–7].

In such a context, the psychology of sustainability can provide an approach for research and intervention to overcome the health risks faced by health students. Based on this conceptual framework, this empirical study explores the relationships between anxiety, emotional intelligence, and coping and assesses the mediating role of health students' emotional intelligence.

The concept of coping refers to the strategies people use to deal with stressful situations. These strategies might consist of resolving or avoiding problems [8]. The different types of coping are problem-focused coping, which centers on the solution to the problem, and emotion-focused coping [9]. In stressful, anxiety-laden situations, those who assume problem-focused coping strategies take an active role in tackling the problem to find a solution [10]. In contrast, people who follow emotion-focused coping strategies tend to evade the problem, adopting problem avoidance strategies that are less effective and more dysfunctional [11] and that may be related to aggression [12].

Health students, particularly nursing students, live through many stressful situations, including clinical procedures, clinical evaluations, relationships with clinical staff, patients, and clinical settings [13,14]. Anxiety caused by these experiences can decrease performance skills, and in a clinical context, this can affect patient safety [15]. Emotional intelligence refers to the ability to control one's own emotions and those of other people, discriminating and using information to shape one's own thoughts and actions appropriately [16]. Hence, emotional intelligence can be considered a resource that facilitates individuals' personal empowerment. We expect emotional intelligence to facilitate functional coping strategies (approaching the problem) in situations of anxiety.

1.1. Anxiety and Coping

According to Lazarus and Folkman [17], coping can be defined as a series of constantly changing cognitive and behavioral processes designed to address the external and/or internal demands of the individual. In this sense, coping addresses both the consequences that cognitive and behavioral processes generate in individuals, as well as the person's interpretation of the situation. If the assessment of a situation is negative and the person lacks the means to deal with it, a stress response associated with physical, psychological, and even emotional symptoms may be triggered. This response leads to a less effective coping style [18]. Clark and Beck [19] concluded that coping strategies often play a significant role in the ongoing presence of disorders such as anxiety and are consistent with latent schematic content and cognitive vulnerability.

In addition, according to information processing theories, focusing one's attention on information perceived as threatening may form the basis for the development and maintenance of anxiety as a trait [20]. Research has identified two types of anxiety, trait and state. State anxiety alludes to a temporary and transitory anxiety, whereas trait anxiety refers to a constant and more permanent personality characteristic [21]. People who tend to become anxious react with physiological excitement, which is increased by worry or negative thoughts [22,23]. These negative thoughts can contribute to reduced effectiveness in task performance [17,24].

Anxiety can lead people to act ineffectively in social environments, and it is associated with poor adaptive coping strategies, which result in negative emotional states and poor overall health [25,26]. Anxiety is a warning system that helps people avoid problems and escape from stressful situations [27]. Coping is a process that is activated when people identify a stressful situation that can cause harm. This situation can be seen as a threat or as a challenge to be overcome. Coping plays a fundamental role in withstanding stress and anxiety [17,28].

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1.2. Anxiety, Coping, and Emotional Intelligence

Cognitive processes such as memory and attention take place when people interpret situations as threatening. Anxious individuals are more likely to interpret neutral stimuli as threats (interpretation bias), recall threatening events (memory bias), and pay attention to threatening stimuli in the environment (attentional bias) [23].

Emotional intelligence was initially conceptualized as a mental ability analogous to general intelligence [29]. However, a growing number of researchers now define emotional intelligence as a personality trait [30]. From this perspective, emotional intelligence includes both the emotional aspects of personality [31] and the ability to process information from the social environment [32]. Emotional intelligence is not conceptualized as a strictly cognitive capacity [30] but rather refers to a collection of behavioral dispositions and self-perceptions related to the ability to recognize, process, and manage emotions and situated at the lower levels of the personality hierarchy [30,33]. Accordingly, emotions are acknowledged as being quite subjective in nature [34].

Emotional intelligence has been positively linked to the use of strategies focused on problems in emotionally strained situations, and to good health evaluated through self-assessment [35]. Altogether, it facilitates an increase in self-efficacy in stressful situations because emotional intelligence helps people see stressful situations as more of a challenge than a threat [36,37]. Thus, we can consider emotional intelligence an individual resource that may be related to the processes of dealing with anxiety in stressful situations and using functional strategies to face such situations.

From this perspective, health professionals are subject to stressful situations, which can be particularly intense during their training given their exposure to stressful processes. These stressful processes stem from both their studies and other stressful factors that are triggered during their placements. During these placements, health students are met with human suffering (patients afflicted with cancer, terminal illness, mental health problems, pediatric emergencies, general emergencies, fear of making mistakes, etc.). This chronic exposure to stress can have negative effects on students' health [38]. Therefore, it is important to understand the role that emotional intelligence plays in mediating anxiety and the use of approach or avoidance coping strategies (problem-focused coping or emotion-focused coping).

Analyzing the strength of health students' emotional intelligence to encourage sustainable development can provide health institutions with a complementary perspective to create programs to educate students in a healthy manner. Doing so can contribute to building healthy, sustainable institutions [2].

1.3. Aims and Hypotheses

This study has two aims: (i) To explore the relationships between health students' emotional intelligence, anxiety, and stress-coping strategies; (ii) to assess the role of emotional intelligence as a mediator of the relationship between these students' anxiety, and functional and dysfunctional coping strategies. Based on the theoretical foundations, we hypothesize the following:

- 1. State and trait anxiety are negatively related to emotional intelligence in all its forms (well-being, self-control, emotionality, sociability, and overall trait) and to approach coping strategies (problem-focused coping). Conversely, state and trait anxiety are positively related to avoidance coping strategies (emotion-focused coping).
- 2. All dimensions of emotional intelligence are negatively related to avoidance and positively related to approach coping.
- 3. Finally, emotional intelligence mediates the relationship between state and trait anxiety, and approach and avoidance coping. Figure 1 shows the resulting model.

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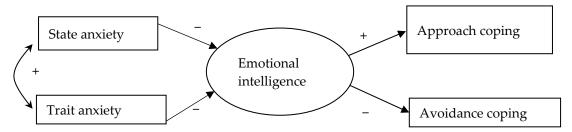


Figure 1. The hypothesized research model.

2. Materials and Methods

2.1. Participants

A total of 434 health students took part in the study. Of these, 76% were women and 24% were men. Their ages ranged from 17 to 54 years (M = 21; SD = 0.320). A total of 71.7% were single, and 23.3% were married or living with a partner. Most of the students (59%) studied at a private university, while 41% studied at a public university. According to their income level, 25% were upper social class, 16.6% were medium-high social class, 36.2% were middle class, and 22.2% were middle-to-low social class.

2.2. Ethical Considerations and Data Collection

We performed a transversal study based on self-reports by health students. The evaluation was collectively undertaken at participants' universities in 50 min sessions preceded by an explanation of the relevant university's ethical standards. Students were of legal age and gave their informed consent. Participation was voluntary and anonymous and conformed to the ethical principles for research on human beings set forth in the Declaration of Helsinki [39]. We started the process by applying for the necessary permission from the universities that participated in the study. Following approval, the students were informed in writing and orally about the voluntary and anonymous nature of the study and the researchers' commitment to confidentiality. The students freely signed a letter confirming their informed consent to participate and their understanding that participation was not mandatory nor would it affect their grades. Data were collected between October 2014 and May 2015. The answers to the questionnaires were stored in a database for analysis. All students who volunteered decided to participate in the study. There were no waivers or losses.

2.3. Instruments

2.3.1. State and Trait Anxiety

This instrument [40] consisted of a 40-item questionnaire that evaluated how an individual felt at a particular moment (20 items on state anxiety) and how they felt in general (20 items on trait anxiety). Likert-type responses ranged from 0 (*never or not at all*) to 3 (*a lot or almost always*). The values for Cronbach's alpha in this study were state anxiety $\alpha = 0.90$ and trait anxiety $\alpha = 0.86$.

2.3.2. Emotional Intelligence TEIQue-SF (Trait Emotional Intelligence Questionnaire)

This questionnaire [41] evaluated the overall emotional intelligence trait in addition to well-being, self-control, emotionality, and sociability dimensions. It consisted of a Likert scale with seven response alternatives ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Cronbach's alpha reliability score for the whole scale was 0.86. The well-being factor evaluated the degree of self-esteem, happiness, and optimism ($\alpha = 0.79$). The self-control factor referred to impulsivity, stress management, and emotional regulation ($\alpha = 0.65$). The emotionality factor evaluated the capacity to express and perceive emotions as well as skill in empathy and relationships ($\alpha = 0.65$). The sociability factor addressed the ability to show assertiveness, manage emotions, and display social competence ($\alpha = 0.64$).

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Lastly, this questionnaire also took the overall emotional intelligence trait into account by evaluating participants' adaptability and self-motivation capacity ($\alpha = 0.66$).

2.3.3. Inventory of Coping Responses for Adults (CRI-A)

This questionnaire [42] comprised 48 items and evaluated how stressful situations were dealt with (by approach or avoidance). The responses were presented on a 4-point scale ranging from 1 (never) to 4 (often). The coping by approach dimension comprised logical analysis, positive reappraisal, seeking guidance and support, and problem solving. The coping by avoidance dimension comprised cognitive avoidance, acceptance or resignation, and seeking alternative rewards. Cronbach's alpha was 0.77 for approach coping and 0.68 for avoidance coping.

2.4. Data Analysis

We first performed a descriptive analysis of the variables and then performed a Pearson correlation analysis to identify interconnections and trends in the relationships between the variables. Next, we tested the fit of our hypothesized theoretical model, enabling us to analyze the mediating role of emotional intelligence in the relationship between anxiety (state and trait) and approach or avoidance coping strategies.

We fitted the model using the maximum likelihood procedure, obtaining robust statistics for normally distributed problems so that we could evaluate model fit and the weight and significance of the loadings. The robust statistics were as follows: chi-square divided by degrees of freedom (χ^2 /df), root mean square error of approximation (RMSEA), Bentler comparative fit index (CFI), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), Tucker–Lewis index (TLI), and standardized root mean square residual (SRMR) [43]. For the proposed model to fit the observed data well, the CFI, GFI, AGFI, and TLI should be close to 1 (for even better fit, these values should be greater than or equal to 0.90) [44,45], the RMSEA should be less than 0.08, and the SRMR should be less than 0.10 [46]. Lastly, we estimated the standardized regression coefficients in the model and their significance. Statistical analyses were performed using SPSS version 21 and AMOS 17.0.

3. Results

3.1. Descriptive Statistics

The descriptive analyses indicate that health students have fairly high levels of emotional intelligence (for personal well-being and emotional control, self-control in the face of stressful situations, a tendency to promote social relationships, and sociability). Conversely, they have low levels of state and trait anxiety, and a tendency to use both approach and avoidance coping strategies. However, they are more likely to use approach coping strategies. These results indicate that health students primarily adopt strategies that help them analyze their problems and adopt active attitudes to help them find effective solutions. However, depending on the situation, they might also adopt other less effective avoidance strategies (Table 1).

The Pearson correlation analysis reveals significant negative relationships between state and trait anxiety and emotional intelligence factors (well-being, self-control, emotionality, sociability, and overall trait) and between state and trait anxiety and approach coping strategies. Conversely, the analysis reveals significant positive relationships between state and trait anxiety and avoidance coping strategies. In all cases, the level of significance is greater than 0.01.

Two different situations can be observed with respect to coping strategies. Approach coping has a significant positive relationship with the factors of emotional intelligence and a negative relationship with state and trait anxiety. The opposite is true for avoidance coping, which has a significant negative relationship with all factors of emotional intelligence and a significant positive relationship with state and trait anxiety (Table 2).

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Variable	Factor	M	SD	Kurtosis	
Emotional intelligence	Well-being	5.37	-0.948	0.568	
	Self-control	4.42	-0.858	-0.147	
	Emotionality	5.29	-0.781	-0.272	
	Sociability	4.52	-0.823	0.268	
	Overall trait	5.02	-0.954	-248	
Americator	State anxiety	0.94		0.763	
Anxiety	Trait anxiety	1.08	-0.436	0.247	
Coping	Approach	2.87	-0.377	-0.113	
	Avoidance	2.31	-0.392	-0.024	

Table 1. Descriptive analysis of emotional intelligence, anxiety, and coping.

Table 2. Correlation analysis between anxiety, emotional intelligence, and stress-coping variables.

	1	2	3	4	5	6	7
1. State anxiety	-						
2. Trait anxiety	0.618 **	-					
3. Well-being	-0.514 **	-0.708 **	-				
4. Self-control	-0.385 **	-0.609 **	0.441 **	-			
5. Emotionality	-0.265 **	-0.454 **	0.485 **	0.355 **	-		
6. Sociability	-0.189 **	-0.352 **	0.311 **	0.225 **	0.335 **	-	
7. Overall trait	-0.394 **	-0.626 **	0.680 **	0.386 **	0.516 **	0.455 **	-
8. Approach strategies	-0.127 **	-0.246 **	0.317 **	0.245 **	0.285 **	0.141 **	0.302 **
9. Avoidance strategies	0.133 **	0.333 **	-0.196 **	-0.305 **	-0.210 **	-0.115 *	-0.169 **

Note: ** p < 0.01; * p < 0.05.

3.2. Structural Equations

The hypothesized structural model, using maximum likelihood estimates, is presented below. It can be used to analyze the relationships between the observed state and trait anxiety factors, the latent emotional intelligence factor, and the observed approach and avoidance coping factors to test the mediating role of emotional intelligence.

Figure 2 shows the significant associations between the variables and the mediating role of emotional intelligence in the relationship between trait anxiety and approach or avoidance coping. State anxiety is not directly related to emotional intelligence. Instead, it is related via trait anxiety. Thus, trait anxiety has a significant relationship with emotional intelligence. Emotional intelligence has a significant relationship with coping, which is positive for approach coping and negative for avoidance coping.

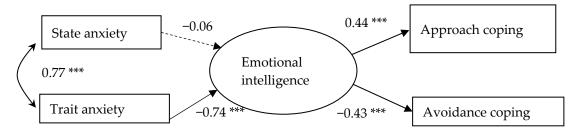


Figure 2. Structural model for state or trait anxiety, emotional intelligence, and approach or avoidance coping.

As shown in Table 3, the model fit indices were excellent. The value of χ^2 divided by the degrees of freedom was low (χ^2 = 4.97), the values of RMSEA and SRMR were less than 0.08 [46], and the remaining robust statistics (GFI, AGFI, CFI, and TLI) were greater than 0.90 [44,45].

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x ²	df	RMSEA	SRMR	GFI	AGFI	CFI	TLI
14.91 ***	3	0.064	0.044	0.985	0.962	0.989	0.981

Table 3. Model fit indices for the health student population.

Note: *** p < 0.0001.

The model shows the mediating role of emotional intelligence in the relationship between state and trait anxiety and coping. Higher levels of emotional intelligence increase the likelihood that approach coping strategies will be used, while lower levels encourage the use of avoidance strategies. Avoidance coping strategies are dysfunctional and do not help the search for effective solutions to problems. Furthermore, students with high emotional intelligence indices are more likely to use approach coping strategies and are less likely to use avoidance coping strategies.

4. Discussion

The objective of this study was to explore the relationships between anxiety, emotional intelligence, and coping strategies in stressful situations and assess the mediating role of emotional intelligence in the relationship between anxiety and coping strategies. The results almost completely verify the hypothesized model (Figure 1). State and trait anxiety are negatively related to all factors of emotional intelligence (well-being, self-control, emotionality, sociability, and overall traits), and approach coping strategies and are positively related to (dysfunctional) avoidance coping strategies, which hinder problem resolution (Hypothesis 1) [36]. High rates of anxiety among health students may encourage the adoption of problem-avoidance strategies. Accordingly, encountering a negatively appraised situation may trigger poor adaptive responses that can create barriers to finding effective solutions to problems. Altogether, this situation can lead to the adoption of ineffective coping strategies and, in turn, an increase in anxiety [18,19].

The results confirm that emotional intelligence supports both functional and active approach coping strategies (problem-focused coping) and curbs avoidance coping strategies (emotion-focused coping), which are less productive and more dysfunctional [36]. Given the involvement of emotional intelligence in socialization, the results provide insight into the role of emotional intelligence in empowering health professionals through suitable training [31,32]. Accordingly, health students with high levels of emotional intelligence should be better prepared to cope with the demands of their studies and placements in natural surroundings, where they must take care of the terminally ill. These situations entail a certain degree of insecurity and generate high levels of stress [13,14,38]. The results can also provide insight into the mechanisms involved in active and problem-focused coping strategies to foster personal empowerment among health students.

The results imply that emotional intelligence is negatively correlated with avoidance coping strategies and positively correlated with approach coping strategies (Hypothesis 2). Furthermore, emotional intelligence can mediate the relationship between state and trait anxiety and coping, stimulating active coping strategies that lead to problem resolution in stressful situations (Hypothesis 3). In this case, mediation is observed with trait anxiety but not with state anxiety. State anxiety is transient and temporary [21], so it has a weaker effect on thoughts or the tendency to interpret environmental stimuli as threatening and negative [23].

Health students with high levels of anxiety that are capable of developing emotional intelligence will be more prepared to cope with the stressful situations that arise in their studies and placements and will be more likely to use problem-focused coping strategies [16]. In general, students with higher levels of anxiety tend to resort to avoidance coping strategies when confronted with stressful situations. These outcomes support the research published by Görgen et al. [25], who reported that anxiety is associated with ineffective strategies for coping with the environment, which lead to negative emotional states and worse overall health. In addition, anxious individuals are unlikely to plan their actions and anticipate stressful situations [26]. All of these tendencies can hinder the activation of cognitive

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and behavioral situation-planning mechanisms [24] that determine the right action in terms of patient attention and care. Therefore, working to develop the emotional intelligence of health students should be a goal for studies so that these students can effectively process and deal with the experiences of patients [38]. Raising emotional intelligence levels can aid information processing and the application of problem-focused strategies. We can thus help improve students' general state of health [35].

5. Conclusions and Limitations

In this study, we explored the possibilities created by the psychology of sustainability and sustainable development for health students in healthy, well-balanced education [1]. We conclude that emotional intelligence may be crucial for health students and for practice in the health profession because it encourages the use of active coping strategies [18]. Emotional intelligence also facilitates interpersonal relationships among health students and helps them to successfully manage their own emotions and the emotions of others [32]. Professional caregivers such as nurses are constantly exposed to stressful situations. Therefore, developing emotional intelligence is desirable in health training programs to stimulate strategies that encourage the building of solid interpersonal relationships [47]. These conclusions are valuable for the sustainable development of health students' well-being. In other words, health students must be prepared to face complex situations with patients and the clinical environment. Therefore, developing emotional intelligence is desirable in health training programs to stimulate strategies that encourage sustainable development in the training of good interpersonal relationships. Emotional education could be included in degree programs. In recent years, it has been shown that university health students with better emotional abilities have lower rates of anxiety [48], which is positive for the well-being and health of these higher education students.

Health students are subject to high anxiety rates. They are at risk of resorting to avoidance coping strategies when faced with stressful situations [25]. Anxious individuals are less likely to plan actions and anticipate stressful situations [26], which can lead to ineffective actions in stressful situations. However, the health profession is full of stressful situations associated with the profession itself (emergencies, terminally ill patients, mental health, etc.). The results of this research show that anxiety and dysfunctional coping are closely related in health students. The results also show that emotional intelligence can curb this process. It would be interesting if these results could be replicated in other areas and university disciplines related to the training of future professionals with a high stress content in early childhood education and primary and secondary education.

This study has some limitations. It is cross-sectional and is based on data for students from Valencia (Spain). The data were collected via questionnaires completed by the students themselves. Participation was not compulsory or linked to course grades. Students were asked to answer honestly, were informed about the overall statistical analysis procedure, and were guaranteed anonymity. However, we are aware that the quality of the results could be improved by using a longitudinal approach and by comparing our data with data from different sources.

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