Article

Emotional Intelligence and University Students' Happiness: The Mediating Role of Basic Psychological Needs' Satisfaction

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Abstract: Given the increasing importance of adjusting to university life and achieving happiness, identifying the effective role of emotional intelligence and psychological needs' satisfaction in enhancing students' well-being is crucial. This study investigated the relation between emotional intelligence, psychological need satisfaction, and university students' happiness. Data were collected from 205 university students (mean age: 23.35; predominantly female) at the University of Crete. Participants completed the Emotional Intelligence Scale, the Oxford Happiness Questionnaire, and the Basic Psychological Needs Satisfaction Scale. The analysis began with a correlation matrix to explore preliminary relations among the key variables. A multiple-linear regression analysis was then conducted to predict happiness levels based on observed correlations. Following this, a multiple-mediation analysis examined how emotional intelligence affects happiness through psychological needs satisfaction. The results indicated a positive association between emotional intelligence and happiness, with psychological needs' satisfaction also positively correlating with happiness. Specifically, the use and regulation of emotion, competence, and autonomy significantly predicted happiness. Path analysis revealed that emotional intelligence indirectly influences happiness, particularly through competence. The results indicate that high emotional intelligence, through the satisfaction of basic psychological needs, is significantly associated with university students' happiness. The study suggests that institutions should guide students in emotional intelligence and competence to increase happiness during their studies.

Keywords: emotional intelligence; happiness; psychological needs' satisfaction; self-determination theory; university students

1. Introduction

Adjusting to university life and feeling happy have become a critical area of research in higher education and student well-being [1]. To this end, it is imperative to identify crucial and effective personal sources and educational practices that enhance university students' happiness. Using both emotional intelligence [2] and self-determination theory [3], the current study investigated the relation between happiness and its antecedents among undergraduate students.

Happiness is defined in various ways [4]. In positive psychology, happiness is recognized as an emotion; it is a mental evaluation of events with positive emotions [5]. Happiness is negatively related to stress, anxiety, and depression, while happier individuals are less prone to mental disorders [6,7]. Even during the COVID-19 (Coronavirus Disease 2019) pandemic, people who reported higher levels of subjective happiness experienced flourishing mental health [8]. University students' happiness has received attention in recent research examining its relationship with motivation [9], self-efficacy [1], leisure [10], perfectionism [11], and literal therapy [12].

Emotional intelligence (EI), as a multidimensional construct involving mental skills and abilities, enables individuals to accurately evaluate, regulate, and express their emotions, as well as understand the emotions of others [2]. Two common constructs differentiated in the EI literature, trait EI (which involves individuals' perceptions of their emotional world and their emotional self-efficacy [13], measured through self-report assessments [14]) and ability EI (which refers to the actual cognitive skills that enable individuals to recognize, understand, and manage emotions [15], and which uses performance-based assessments [16]). Both constructs have a positive impact on academic settings, including psychological well-being [17].

EI has been linked to happiness with mixed results. For instance, no significant correlation was found between the Mayer–Salovey–Caruso Emotional Intelligence Test [18] (MSCEIT) and life satisfaction [19] (SWLS) in a study of 202 Israeli adolescents [20]. However, a positive relationship between EI and happiness was observed in studies with 188 male adolescents in Tehran [21], 412 Malaysian high-school students [22], and 400 university students in Spain [23]. Although a positive association between EI and happiness was revealed through a recent meta-analyses, in both Western [24] and Chinese cultures [25], rather less attention has been paid to the mechanisms or processes underlying this relation.

In academic settings, basic psychological needs theory [26,27] (BPNT) posits that all students have inherent psychological needs that must be fulfilled to enhance learning, well-being, and adaptive coping with changes [28]. Specifically, students have a set of three inherent, motivational, and universal basic psychological needs [26,27], namely autonomy (controlling their own actions and decisions), competence (interacting effectively with the learning environment), and relatedness (feeling connected with their instructors and fellow students). The fulfillment of these inherent needs during learning activities allows students to thrive and to function optimally [3]. Conversely, when these needs are not fulfilled, students are more likely to experience mental health problems, which can then subsequently affect achievement [29].

Recent research has explored the mediating role of psychological needs' satisfaction in studies examining students' happiness. For example, in a sample of Chinese adolescents, psychological need satisfaction was the mediator in the relationship between school-related social support and school-related happiness [30]. In a structural equation modeling study (*n* = 1961), Froiland et al. [31], examining teacher–student relationships, psychological need satisfaction, and happiness among diverse students, proposed that teacher–student relationships could promote happiness by meeting psychological needs. In addition, in a study examining between- and within-person-level associations [32], grit was positively associated with adolescents' subjective well-being, and needs' satisfaction was a mediator, while daily grit promoted happiness by satisfying basic psychological needs. However, it remains unclear whether psychological needs' satisfaction mediates the link between EI and happiness.

Our study focused on university students–emergent adults [33,34] because, during this period, these individuals navigate the complex transition to adulthood [35,36], facing various challenges, including academic stress, life transitions, and career planning, which can intensely impact their happiness, affecting their academic performance as well [4]. Several other studies have explored factors affecting happiness, such as academic satisfaction [37], parental support [38], romantic relationships [39], and emotional stability [40], revealing its prevalence in this population sample. Therefore, the current study had two specific aims: (a) to examine whether students' emotional intelligence abilities are related to their happiness and (b) to explore whether students' basic psychological needs' satisfaction mediates the relations between students' emotional intelligence and happiness.

We hypothesized that both EI and psychological needs' satisfaction would have a positive relationship with happiness (H1 and H2). Among predictors, EI and psychological needs' satisfaction would predict happiness (H3 and H4, respectively). Finally, the satisfaction of needs concerning competence, autonomy, and relatedness would mediate the relationship between EI and happiness (H5).

2. Materials and Methods

2.1. Participants and Procedure

The study received approval from the University of Crete research ethics committee (15/25-1-2024). A web-based survey was conducted in Greece during the spring semester of the 2022–2023 academic year. 205 university students from the University of Crete were selected through simple random sampling to participate in the research, and they were recruited by the researchers during class time. The students were asked to voluntarily complete an online questionnaire forwarded by the first two authors to the prospective participants. The home page of the electronic questionnaire provided information on the purpose of the study. Participants gave their consent after they were informed that the questionnaire was anonymous and that they had the opportunity to withdraw at any time.

Statistical power and sample size calculations were performed using G*Power software [41] (version 2.3.17), developed by the University of Düsseldorf, Düsseldorf, Germany. For the multiple linear regression analysis that was used, the required sample size was determined based on an anticipated effect size, f^2, of 0.15, an alpha error probability of 0.05, and a power of 0.95. The analysis indicated that a minimum of 107 participants would be necessary ($F_{(2, 98)}$ = 3.089; noncentrality parameter λ = 16.05, actual power = 0.95). Additionally, for the mediation analyses that were used, a sample size of 129 was required to achieve similar power levels and statistical confidence ($F_{(4, 124)}$ = 2.445; noncentrality parameter λ = 19.35; actual power = 0.95). The participants' ages ranged from 18 to 51 years, with a mean age of 23.35 years (SD = 6.73) and a median age of 21 years. The sample's gender composition was predominantly female (86%, *n* = 176), with males representing 13% (*n* = 27) and other gender identities accounting for 1% (*n* = 2).

2.2. Measures

2.2.1. Emotional Intelligence

Students' emotional intelligence was assessed using the Greek version of the Wong and Law Emotional Intelligence Scale (WLEIS) [42,43], consisting of 16 items rated on a 5-point Likert scale (1 = totally disagree; 5 = totally agree). Following the components of emotional intelligence proposed by Mayer and Salovey [44], the scale includes four subscales: Self-Emotion Appraisal (SEA; e.g., "I always know whether or not I am happy"), Appraisal of Others' Emotion (AOE; e.g., "I am sensitive to the feelings of others"), Use of Emotion (UOE; e.g., "I always tell myself I am competent"), and regulation of emotion (ROE; e.g., "I am capable of controlling my emotions"). Reliability was satisfactory (α = 0.86, ω = 0.87), with subscale reliabilities ranging from α = 0.68 to 0.79 and ω = 0.72 to 0.82. Confirmatory factor analysis (Relative chi-square χ^2/df = 2.08, Comparative fit index CFI= 0.91, Tucker–Lewis index (TLI) = 0.89, standardized root mean square residual (SRMR) = 0.07, root mean square error of approximation (RMSEA) = 0.06) confirmed the scale's validity for measuring emotional intelligence in a Greek-speaking sample.

2.2.2. Happiness

In the current study, we used the Oxford Happiness Inventory [45] (OHQ), which is one of the most used measures to investigate happiness [46], and which has been translated and validated into many languages, including Greek [47]. Using this measure, EI was revealed as a predictive factor for happiness [48–50]. The Oxford Happiness Questionnaire [45] (OHQ; a = 0.92), consisting of 8 items (e.g., "I feel that life is very rewarding"), was used to assess students' happiness. The participants rated each item on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale has a unidimensional structure [45]. Recent studies have shown that this questionnaire has good validity and reliability (e.g., Pákozdy et al., [11]; α = 0.78).

The scale demonstrated satisfactory reliability and validity in this study. The scale's reliability was confirmed with a Cronbach's alpha of 0.74 and a McDonald's omega of 0.74, indicating good internal consistency. A confirmatory factor analysis (CFA) provided support for the scale's construct validity. The model fit indices were robust: the Chi-square-

to-degrees of freedom ratio (χ^2/df) was 1.48, p = 0.091, indicating a reasonable fit. The comparative fit index (CFI) was 0.97, the Tucker–Lewis index (TLI) was 0.96, and the standardized root mean square residual (SRMR) was 0.04, which all suggest an excellent model fit. The root mean square error of approximation (RMSEA) was 0.05 with a 90% confidence interval ranging from 0.00 to 0.09, further confirming the adequacy of the model.

2.2.3. Basic Psychological Needs' Satisfaction

The 21-item scale, measuring the satisfaction of needs for autonomy, competence, and relatedness based on self-determination theory [3,27], was also used. The participants indicated on a scale from 1 (not true at all) to 7 (very true) the extent to which items were true for them. The scores on this scale demonstrated adequate reliability for autonomy (e.g., "I am free to express my ideas and opinions"; seven items), competence (e.g., "Most days I feel a sense of accomplishment from my schoolwork"; six items), and relatedness (e.g., "I really like the people I go to school with"; eight items).

According to preliminary analyses of the scale, satisfactory levels of reliability were revealed (α = 0.87; ω = 0.88). The subscales' reliability was also robust (from 0.70 to 0.79). The confirmatory factor analysis (CFA) confirmed the correspondence of the obtained model to the experimental one (autonomy: χ^2/df = 2.18, CFI = 0.95, TLI = 0.92, SRMR = 0.05, and RMSEA = 0.08; competence: χ^2/df = 2.03, CFI = 0.96, TLI = 0.93, SRMR = 0.04, and RMSEA = 0.07; and relatedness: χ^2/df = 1.94, CFI = 0.95, TLI = 0.93, SRMR = 0.04, and RMSEA = 0.07).

2.3. Statistical Analysis

Statistical analysis was performed using Jamovi 2.3.17, developed by The Jamovi Project Pty Ltd, Tighes Hill, New South Wales, Australia. We ensured data accuracy and checked assumptions, confirming no missing data. Descriptive statistics were examined, and latent variables were created. A correlation matrix explored the relations among these variables, followed by a multiple linear regression with happiness (OHQ) as the dependent variable, which was influenced by SEA, AOE, UOE, ROE, autonomy, competence, and relatedness. Four mediation analyses assessed the indirect effects of SEA, AOE, UOE, and ROE on happiness through autonomy, competence, and relatedness, providing insights into emotional intelligence's mediated influence on well-being.

3. Results

The analysis started with a correlation matrix, showing significant relations among the main variables (see Table 1).

Table 1. Descriptive statistics and correlations of the latent variables.

	SEA	AOE	UOE	ROE	OHQ	AUTO	COMP	RELAT
SEA	—							
AOE	0.42 *	—						
UOE	0.49 *	0.31 *	—					
ROE	0.55 *	0.23 *	0.47 *	—				
OHQ	0.49 *	0.29 *	0.59 *	0.48 *	—			
AUTO	0.45 *	0.19 **	0.49 *	0.31 *	0.66 *	—		
COMP	0.48 *	0.20 **	0.57 *	0.44 *	0.71 *	0.63 *	—	
RELAT	0.39 *	0.37 *	0.34 *	0.35 *	0.56 *	0.63 *	0.49 *	—
Mean	5.26	5.55	5.11	4.60	4.17	4.87	4.61	5.32
SD	0.91	0.82	1.01	1.04	0.79	0.96	0.99	0.88

Note. ** p < 0.01, and * p < 0.001. SEA: self-emotion appraisal; AOE: appraisal of others' emotion; UOE: use of emotion; ROE: regulation of emotion; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness, SD: Standard Deviation.

In Table 2, multiple linear regression was used to predict happiness based on variables identified from earlier correlations. Predictors included SEA, AOE, UOE, ROE, autonomy,

competence, and relatedness. The Durbin–Watson statistic (2.15; $p = 0.264$) showed no significant autocorrelation. The Variance Inflation Factor (VIF) values were below 3, indicating no multicollinearity. The Shapiro–Wilk test confirmed a normal distribution of residuals (W = 0.99; $p = 0.734$). The model explained 64% of the variance in happiness ($R^2 = 0.64$; adjusted $R^2 = 0.63$) and was a good fit (root mean square error, RMSE = 0.47), with F (8, 196) = 43.84, and $p < 0.001$.

Table 2. Model coefficients for the happiness index.

Predictor	B	SE	95% CI		t	p	β	95% CI	
			LL	UL				LL	UL
Intercept	0.17	0.36	−0.55	0.88	0.46	0.649			
SEA	−0.01	0.05	−0.11	0.09	−0.22	0.823	−0.01	−0.13	0.10
AOE	0.06	0.05	−0.04	0.15	1.18	0.241	0.06	−0.04	0.16
UOE	0.12	0.04	0.04	0.21	2.77	0.006	0.16	0.05	0.27
ROE	0.10	0.04	0.02	0.19	2.49	0.013	0.14	0.03	0.25
AUTO	0.21	0.05	0.10	0.31	3.77	<0.001	0.25	0.12	0.38
RELAT	0.10	0.05	−0.01	0.21	1.86	0.065	0.11	−0.01	0.23
COMP	0.26	0.05	0.15	0.36	4.95	<0.001	0.32	0.19	0.45

Note. SEA: self-emotion appraisal; AOE: appraisal of others' emotion; UOE: use of emotion; ROE: regulation of emotion; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness, CI: Confidence Interval, SE: Standard Error, LL: Lower Limit, UL: Upper Limit, t: t-value, *p*: *p*-value, β: Standardized Beta Coefficient.

Competence was the strongest predictor of happiness (B = 0.26, β = 0.32, and $p < 0.001$). Autonomy also significantly predicted happiness (B = 0.21, β = 0.25, and $p < 0.001$). UOE (B = 0.12, β = 0.16, and $p = 0.006$) and ROE (B = 0.10, β = 0.14, and $p = 0.013$) were positively related to happiness, indicating that emotional usage and regulation contribute to enhanced happiness. SEA did not significantly predict happiness (B = −0.01, β = −0.01, and $p = 0.823$), while AOE (B = 0.06, β = 0.06, and $p = 0.241$) and relatedness (B = 0.10, β = 0.11, and $p = 0.065$) showed positive but non-significant relations.

Subsequently, a multiple-mediation analysis was conducted to examine the indirect effects of SEA on happiness (OHQ) via three psychological mediators: autonomy (AUTO), competence (COMP), and relatedness (RELAT) (see Figure 1).
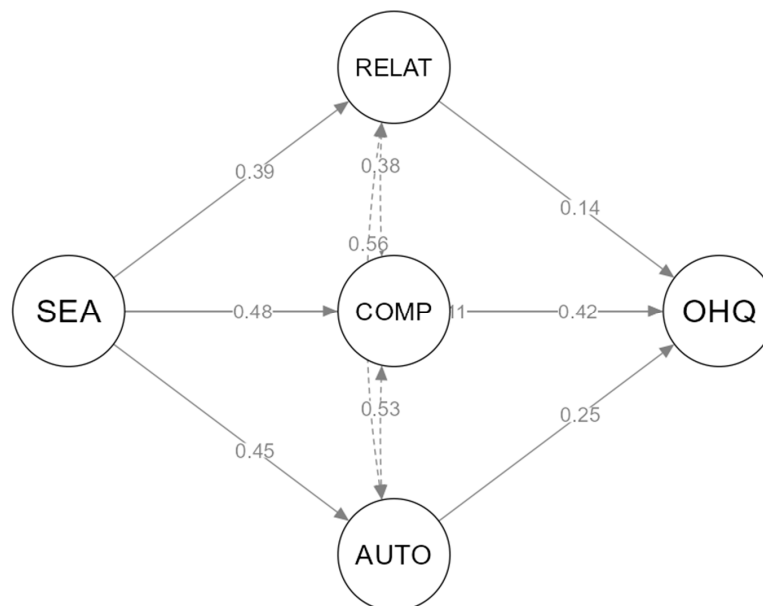

Figure 1. Self-emotion appraisal and indirect and total effects on happiness. SEA: self-emotion appraisal; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness.

The mediation model showed that SEA positively predicted autonomy (β = 0.45, SE = 0.07, and *p* < 0.001), competence (β = 0.48, SE = 0.07, and *p* < 0.001), and relatedness (β = 0.39, SE = 0.06, and *p* < 0.001), which in turn predicted happiness (see Table 3). Specifically, autonomy (β = 0.25, SE = 0.05, and *p* < 0.001), competence (β = 0.42, SE = 0.05, and *p* < 0.001), and relatedness (β = 0.14, SE = 0.05, and *p* = 0.015) were significantly linked to happiness. The indirect effects of SEA on happiness through autonomy (β = 0.12, SE = 0.03, 95% CI [0.04, 0.16], and *p* < 0.001), competence (β = 0.20, SE = 0.03, 95% CI [0.11, 0.24], and *p* < 0.001), and relatedness (β = 0.06, SE = 0.02, 95% CI [0.01, 0.09], and *p* = 0.024) were significant, suggesting that SEA enhances happiness by boosting autonomy, competence, and social relatedness. SEA also had a direct effect on happiness (β = 0.11, SE = 0.04, 95% CI [0.01, 0.19], and *p* = 0.028). The total effect of SEA on happiness was substantial (β = 0.49, SE = 0.05, 95% CI [0.32, 0.52], and *p* < 0.001).

Table 3. Self-emotion appraisal and indirect and total effects on happiness.

Type	Effects	Estimate	SE	95% CI LL	95% CI UL	β	z	p
Indirect	SEA ⇒ AUTO ⇒ OHQ	0.10	0.03	0.04	0.16	0.12	3.44	<0.001
	SEA ⇒ COMP ⇒ OHQ	0.18	0.03	0.11	0.24	0.20	5.27	<0.001
	SEA ⇒ RELAT ⇒ OHQ	0.05	0.02	0.01	0.09	0.06	2.26	0.024
Component	SEA ⇒ AUTO	0.48	0.07	0.35	0.60	0.45	7.25	<0.001
	AUTO ⇒ OHQ	0.21	0.05	0.10	0.31	0.25	3.90	<0.001
	SEA ⇒ COMP	0.52	0.07	0.39	0.65	0.48	7.86	<0.001
	COMP ⇒ OHQ	0.34	0.05	0.24	0.43	0.42	7.10	<0.001
	SEA ⇒ RELAT	0.38	0.06	0.26	0.50	0.39	6.13	<0.001
	RELAT ⇒ OHQ	0.13	0.05	0.02	0.23	0.14	2.44	0.015
Direct	SEA ⇒ OHQ	0.10	0.04	0.01	0.19	0.11	2.20	0.028
Total	SEA ⇒ OHQ	0.42	0.05	0.32	0.52	0.49	8.00	<0.001

Note. Confidence intervals computed with the standard method (delta method). Betas are completely standardized effect sizes. SEA: self-emotion appraisal; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness, *z* = *z*-value.

Further mediation analyses examined AOE's indirect effects on happiness (OHQ) through autonomy, competence, and relatedness as potential mediators (see Figure 2).
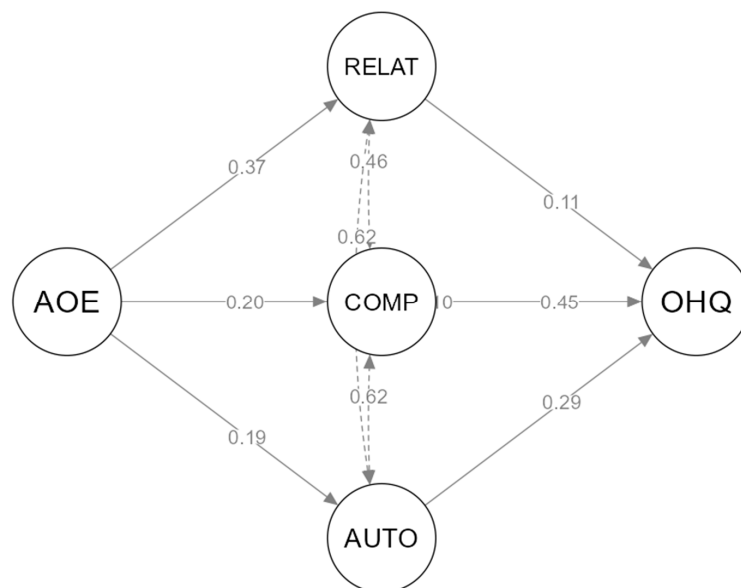

Figure 2. Appraisal of others' emotion and indirect and total effects on happiness. SEA: self-emotion appraisal; AOE: appraisal of others' emotion; UOE: use of emotion; ROE: regulation of emotion; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness.

The analysis revealed that AOE significantly predicted autonomy ($\beta = 0.19$, $z = 2.79$, and $p = 0.005$), competence ($\beta = 0.20$, $z = 2.94$, and $p = 0.003$), and relatedness ($\beta = 0.37$, $z = 5.77$, and $p < 0.001$). These predictors, in turn, influenced happiness: autonomy ($\beta = 0.29$, $z = 4.42$, and $p < 0.001$) and competence ($\beta = 0.45$, $z = 7.83$, and $p < 0.001$) had significant effects, while relatedness showed a non-significant positive trend ($\beta = 0.11$, $z = 1.87$, and $p = 0.062$). Indirect effects of AOE via autonomy ($\beta = 0.05$, $z = 2.36$, and $p = 0.018$) and competence ($\beta = 0.09$, $z = 2.75$, and $p = 0.006$) were significant, but the path through relatedness was not ($\beta = 0.04$, $z = 1.78$, and $p = 0.076$). AOE also had a direct effect on happiness ($\beta = 0.10$, $z = 2.18$, and $p = 0.029$), with a total effect of $\beta = 0.29$ ($z = 4.35$; $p < 0.001$) (see Table 4).

Table 4. Appraisal of others' emotion and indirect and total effects on happiness.

Type	Effects	Estimate	SE	95% CI		β	z	p
				LL	UL			
Indirect	AOE ⇒ AUTO ⇒ OHQ	0.05	0.02	0.01	0.10	0.05	2.36	0.018
	AOE ⇒ COMP ⇒ OHQ	0.09	0.03	0.03	0.15	0.09	2.75	0.006
	AOE ⇒ RELAT ⇒ OHQ	0.04	0.02	−0.00	0.09	0.04	1.78	0.076
Component	AOE ⇒ AUTO	0.22	0.08	0.07	0.38	0.19	2.79	0.005
	AUTO ⇒ OHQ	0.23	0.05	0.13	0.34	0.29	4.42	<0.001
	AOE ⇒ COMP	0.24	0.08	0.08	0.41	0.20	2.94	0.003
	COMP ⇒ OHQ	0.36	0.05	0.27	0.45	0.45	7.83	<0.001
	AOE ⇒ RELAT	0.40	0.07	0.27	0.54	0.37	5.77	<0.001
	RELAT ⇒ OHQ	0.10	0.05	−0.01	0.21	0.11	1.87	0.062
Direct	AOE ⇒ OHQ	0.10	0.05	0.01	0.19	0.10	2.18	0.029
Total	AOE ⇒ OHQ	0.28	0.06	0.15	0.41	0.29	4.35	<0.001

Note. Confidence intervals computed with the standard method (delta method). Betas are completely standardized effect sizes. *Note.* AOE: appraisal of others' emotion; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness.

Building on the analyses of SEA and AOE, the third mediation analysis examined UOE's indirect effects on happiness (OHQ) through autonomy, competence, and relatedness as mediators (see Figure 3).
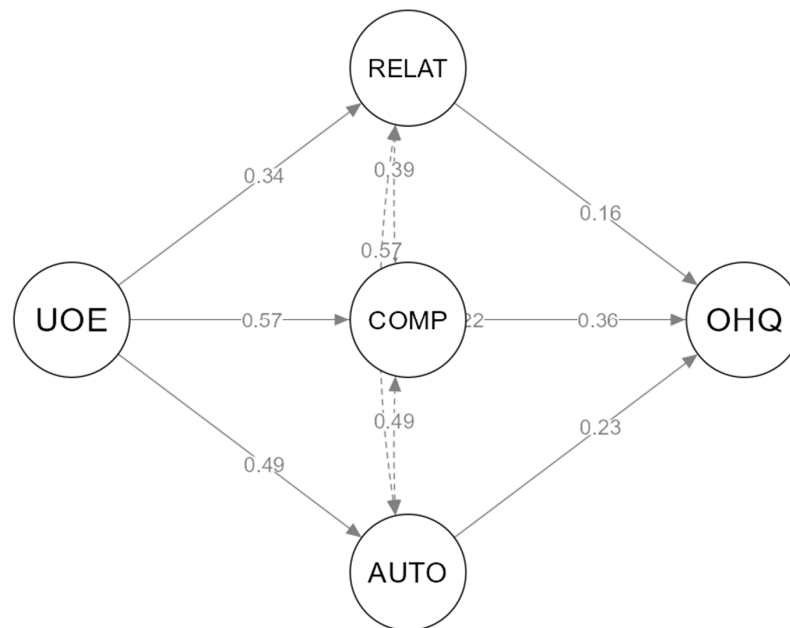

Figure 3. Use of emotion and indirect and total effects on happiness. UOE: use of emotion; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness.

UOE significantly predicted autonomy (β = 0.49; *p* < 0.001), competence (β = 0.57; *p* < 0.001), and relatedness (β = 0.34; *p* < 0.001). These needs, in turn, significantly predicted happiness, showing how effective emotional use promotes well-being (See Table 5). The indirect effects were significant: autonomy (β = 0.11; *p* = 0.001), competence (β = 0.21; *p* < 0.001), and relatedness (β = 0.05; *p* = 0.012). These findings highlight UOE's role in enhancing happiness by supporting psychological well-being. Additionally, UOE had a direct effect on happiness (β = 0.22; *p* < 0.001), reinforcing its importance in emotional well-being. The total effect was substantial (β = 0.59; *p* < 0.001).

Table 5. Use of emotion and indirect and total effects on happiness.

Type	Effects	Estimate	SE	95% CI		β	z	p
				LL	UL			
	UOE ⇒ AUTO ⇒ OHQ	0.09	0.03	0.03	0.14	0.11	3.23	0.001
Indirect	UOE ⇒ COMP ⇒ OHQ	0.16	0.03	0.10	0.22	0.21	5.11	<0.001
	UOE ⇒ RELAT ⇒ OHQ	0.04	0.02	0.01	0.08	0.05	2.51	0.012
	UOE ⇒ AUTO	0.47	0.06	0.35	0.58	0.49	8.00	<0.001
	AUTO ⇒ OHQ	0.18	0.05	0.08	0.29	0.23	3.54	<0.001
	UOE ⇒ COMP	0.56	0.06	0.45	0.67	0.57	9.97	<0.001
Component	COMP ⇒ OHQ	0.29	0.05	0.19	0.38	0.36	5.96	<0.001
	UOE ⇒ RELAT	0.30	0.06	0.18	0.41	0.34	5.14	<0.001
	RELAT ⇒ OHQ	0.14	0.05	0.05	0.24	0.16	2.87	0.004
Direct	UOE ⇒ OHQ	0.17	0.04	0.09	0.25	0.22	4.12	<0.001
Total	UOE ⇒ OHQ	0.46	0.04	0.37	0.55	0.59	10.44	<0.001

Note. Confidence intervals computed with the standard method (delta method). Betas are completely standardized effect sizes. UOE: use of emotion; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness.

The final mediation analysis examined ROE's indirect effects on happiness (OHQ) through autonomy, competence, and relatedness. Each need was analyzed as a mediator between ROE and happiness, along with a comprehensive model integrating all pathways (see Figure 4).
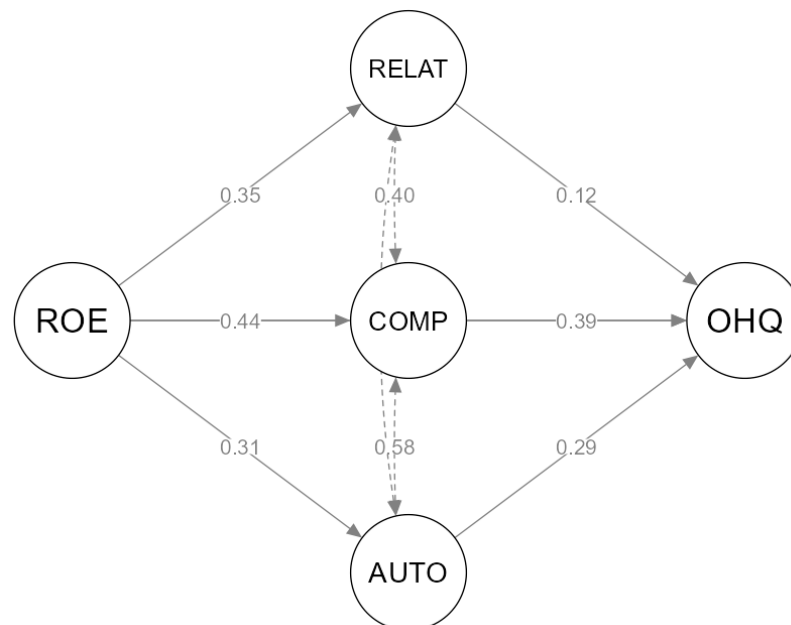

Figure 4. Regulation of emotion and indirect and total effects on happiness. ROE: regulation of Emotion; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness.

The mediation analysis showed that ROE significantly influenced autonomy ($\beta = 0.31$; $p < 0.001$), competence ($\beta = 0.44$; $p < 0.001$), and relatedness ($\beta = 0.35$; $p < 0.001$), highlighting the role of emotional regulation in enhancing psychological needs. Each mediator impacted happiness: autonomy ($\beta = 0.29$; $p < 0.001$), competence ($\beta = 0.39$; $p < 0.001$), and relatedness ($\beta = 0.12$; $p = 0.037$). Significant indirect effects were found for autonomy ($\beta = 0.09$; $p = 0.001$) and competence ($\beta = 0.17$; $p < 0.001$), while relatedness showed a near-significant effect ($\beta = 0.04$; $p = 0.052$). ROE also had a direct effect on happiness ($\beta = 0.18$; $p < 0.001$), contributing independently to happiness. The total effect of ROE on happiness was substantial ($\beta = 0.48$; $p < 0.001$), including both direct and mediated effects through psychological needs (see Table 6).

Table 6. Regulation of emotion and indirect and total effects on happiness.

Type	Effects	Estimate	SE	95% CI		β	z	p
				LL	UL			
	ROE ⇒ AUTO ⇒ OHQ	0.07	0.02	0.03	0.11	0.09	3.23	0.001
Indirect	ROE ⇒ COMP ⇒ OHQ	0.13	0.03	0.08	0.18	0.17	4.79	<0.001
	ROE ⇒ RELAT ⇒ OHQ	0.03	0.02	−0.00	0.06	0.04	1.94	0.052
	ROE ⇒ AUTO	0.28	0.06	0.16	0.40	0.31	4.60	<0.001
	AUTO ⇒ OHQ	0.23	0.05	0.13	0.34	0.29	4.52	<0.001
Component	ROE ⇒ COMP	0.42	0.06	0.30	0.53	0.44	7.02	<0.001
	COMP ⇒ OHQ	0.31	0.05	0.22	0.40	0.39	6.55	<0.001
	ROE ⇒ RELAT	0.30	0.06	0.19	0.40	0.35	5.35	<0.001
	RELAT ⇒ OHQ	0.11	0.05	0.01	0.21	0.12	2.08	0.037
Direct	ROE ⇒ OHQ	0.14	0.04	0.07	0.21	0.18	3.80	<0.001
Total	ROE ⇒ OHQ	0.37	0.05	0.28	0.46	0.48	7.92	<0.001

Note. Confidence intervals computed with the standard method (delta method). Betas are completely standardized effect sizes. ROE: regulation of emotion; OHQ: Oxford Happiness Questionnaire; AUTO: autonomy; COMP: competence; RELAT: relatedness.

4. Discussion

Aiming to explore university students' happiness, the current study indicated that EI was positively and significantly related to happiness (H1). Specifically, SEA had the strongest correlation with happiness, followed by UOE and ROE. Our findings suggest that understanding, using, and regulating emotions are important contributors to increased happiness, assuring that highly emotionally intelligent people are happier [23,25,51]. Similarly, psychological needs' satisfaction also showed strong positive correlations with happiness (H2). These relationships clearly reveal that university students who are autonomous, competent, and connected with others tend to experience higher levels of happiness. Therefore, our results highlight the beneficial role of psychological needs' satisfaction [3].

Among predictors, UOE and ROE significantly predicted happiness (H3), corresponding with studies proposing that these specific EI components, as affective–cognitive structures or emotion schemas, promote adaptive functioning [52]. Nevertheless, a recent systematic review and meta-analysis by Quílez-Robres et al. [53] suggested that setting up programs to stimulate EI in academic settings can improve both personal development and academic performance. Following this suggestion, our findings could suggest further implications for institutions, such as activating achievement emotions of enjoyment, hope, and pride to enhance students' motivation [54], as well as counseling and psychological services, focused on emotional regulation techniques such as mindfulness, cognitive-behavioral strategies, and stress management [55].

In addition, competence and autonomy significantly predicted university students' happiness (H4). This understanding suggests that, when students satisfy their needs for competence and autonomy, they feel happier. These findings align with previous research by Deci and Ryan [3], who also identified competence and autonomy as key predictors of well-being in academic settings. Based on the above, several implications for institutions can be suggested to help students satisfy both psychological needs, such

as enhancing students' sense of competence through mentorship programs and effective feedback systems [56] and promoting autonomy by allowing students to choose individual or group work and engage in optional tests [57].

Finally, the current study indicated indirect effects of competence on the relation between EI and university students' happiness (H5). The study revealed a clear causal relationship between competence and happiness, with competence mediating the relationship between emotional intelligence and happiness. Specifically, the mediation results showed that EI influences happiness not only directly but also indirectly through the satisfaction of psychological need for competence. Therefore, we can say that highly intelligent individuals are more capable of fulfilling this need, which in turn increases their happiness. This finding is in line with previous studies that reveal competence as the dominant variable among the three types of basic psychological needs and suggest enhancing students' competence in the context of higher education [57,58]. Taken together, the study suggests that having high EI through competence is a promising path toward university students' happiness. Given that studying at university is a crucial period for personal growth, these findings offer valuable insights for professors and stakeholders to foster happiness among university students. Evidence-based intervention programs, aiming at improving emergent adolescents' well-being, could facilitate their smooth transition to adulthood [59].

However, we are cautious about stating causal relations because of the self-reported instruments and the cross-sectional design of the study. Future studies could apply multiple assessment methods (e.g., focus groups and diary studies) and use longitudinal patterns to strengthen the validity of the findings. Additionally, given that female university students score higher in EI than their male counterparts (e.g., Fida et al., [60]; Meshkat & Nejati, [61]), while females are less happy than males (e.g., Barattucci et al., [46]; Gawas, [62]), future research should strive for a more gender-balanced sample. We should also mention the specific cultural context of our study, as all participants were Greek university students. This cultural specificity may have introduced potential bias, limiting the generalizability of the findings to students from different cultural backgrounds. Future research should aim to replicate the study in more diverse cultural settings to assess the validity of the results. All in all, the current study provides useful suggestions for institutions that can have a positive effect on university students' happiness and, therefore, on their academic performance.

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