Article

Emotional intelligence and resilience: predictors of life satisfaction among mountain trainers

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Abstract: High-level performance in mountain sports would be unlikely unless different emotional factors are taken into account through the analysis of psychological characteristics such as mood, resilience or motivation, among many others. In this study, 788 people with a sports degree from the Spanish Federation of Mountain Sports and Climbing (FEDME) participated, 75.3% are men and 24.5% are women. The mean age of the participants was 49.8 years (±12.8), ranging from 18 to 76 years. The Wong Law Emotional Intelligence Scale (WLEIS-S), the RS-14 Resilience Scale and the Satisfaction with Life Scale (SWLS) instrument were used. The aim of this research was to determine the relationship between the dimensions of emotional intelligence, resilience and life satisfaction. The results showed a relationship between several of the dimensions from the instruments used (p<.01). In terms of gender, higher scores were found for women than for men. The regression model shows that both the dimensions of emotional intelligence [Appraisal of own emotions (β=.104; p<.001); Use of emotions (β=.30; p<.001); Emotional Regulation (β=.103; p<.001)] and resilience [Personal competence (β=.402; p<.001)], are predictors of greater life satisfaction, with 44.1% positively explained by the regression model. Further proposals should extend the results obtained with the analysis of more sports modalities and provide evidence that would complement those extracted in this research.

Keywords: emotional intelligence, mountain sports, life satisfaction, resilience.

1. Introduction

Mountain sports have experienced significant growth worldwide, especially in the last decade. They have a sporting environment with its own characteristics, different from other sports and risky conditions in some cases, which may affect the athletes' profile at a physical level, but above all, psychologically.

There are still few studies that analyse emotional intelligence (EI), resilience and its relationship with life satisfaction in mountain sports. EI and resilience are likely to positively affect sporting performance in extreme conditions. Resilience is defined as the ability to present adaptive responses to adverse situations [1]. It is a factor related to emotions with optimism, well-being and problem-solving ability [2]. Tabibnia [3] considers that among the usual techniques for increasing resilience is exposure to nature and the natural environment through hiking in natural areas. The resilience of mountain athletes has been analysed in relation to addiction to mountain sports [4, 5], as well as to emotional regulation for better-integrated risk management [6].

In relation to the concept of EI, Petrides et al. [7] distinguish 2 different constructs of EI: EI as a personality trait, and on the other hand, EI as a capability. Among the studies of practitioners of outdoor sports activities we highlight those that employ emotional regulation strategies [8, 9], the influence of EI on performance [10] or climbing [11].

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One of the most productive fields of EI research focuses primarily on providing evidence of the relationship with psychological well-being and life satisfaction, both objective and subjective [12]. In this regard, we highlight some studies that have analysed the relationship between life satisfaction and optimism in mountain sports [13], personality and emotional responses in hikers [14]. In other words, different studies point to the existence of a positive correlation between emotional intelligence as a trait and perceived happiness [15]. On the other hand, from the ability model, some research based on Spanish mountaineering and climbing athletes shows that emotional clarity and regulation are positively correlated with life satisfaction [8]. Similarly, the dimensions of personal competence and self- and life acceptance mediate the relationship between EI and life satisfaction [16]. It should be considered that attitudes associated with personal emotions determine the variation in subjective well-being to a large extent. Different research shows that emotional competencies involve an ability that allows mountain and climbing athletes to orient their thoughts and reflect on their emotions, helping them to improve their performance levels [4, 5].

Supporting this position, Frochot et al. [17] analysed the satisfaction of practitioners of these mountain sports disciplines and the self-perceived well-being produced by this activity in mountain tourism contexts, finding relationships between them. It has also been shown that outdoor sports activity in a natural environment improves self-esteem and it is more restorative than sports activity in an urban environment [18, 19]. Engemann et al. [20] found that the risk of psychological disorders from adolescence to adulthood decreases when there are numerous green spaces near the place of residence. The positive effects of EI and resilience, related to life satisfaction, can promote effective coping strategies in adverse situations [16] as can be seen in Figure 1, where the proposed theoretical model is presented.

Based on these considerations, this paper has three general objectives: (a) To analyse the existence of significant correlations between the dimensions of the instruments considered (WLEIS-S) of EI, (RS-14) of Resilience and (SWLS) Life Satisfaction. (b) To determine the existence of significant differences between each of the dimensions of the instruments used and the sociodemographic variables gender and age. (c) To predict which dimensions explain greater Life Satisfaction.

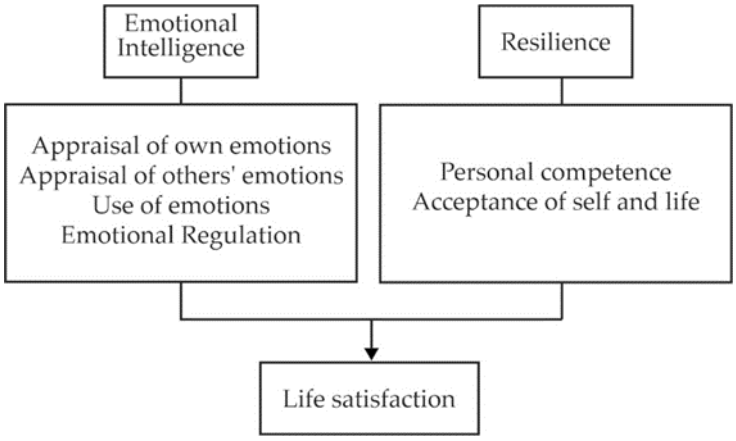

Figure 1. Proposed Theoretical Model

2. Materials and Methods

2.1. Participants

The participants are 788 people with a sports degree, who took part in this study during the year 2022. All these people had a valid sports licence from the Spanish Federation of Mountain Sports and Climbing (FEDME) and had taken some formal mountain sports training or federative training throughout their lives. With regard to gender distribution, 75.3% are men (593 cases) and 24.5% are women (193 cases) and 2 people (0.3%)

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consider that they belong to the "other gender" category (binary, etc.). The mean age of the participants is 49.8 years (±12.8), which ranges from 18 to 78 years.

The sample exceeds the minimum number of subjects necessary to infer the sample size for a confidence level of 95% and an estimation error of 4%, the number of estimated subjects is 598, with the number of subjects in the study sample exceeding this value (n=788).

The number of predictors of Life Satisfaction in our model is 2, the results of the statistical power analysis show a power of .948 above 80% and at 5% significance level to observe R2 values of less than 10%. Consequently, no problems related to the adequacy of the sample size were found.

2.2. Instruments

In order to carry out the different analyses, the socio-demographic variables gender and age were included in order to collect relevant information and analyse the existence of significant differences according to these variables.

WLEIS-S. The Spanish version of the Wong Law Emotional Intelligence Scale (WLEIS-S) was used to assess EI [15]. It is based on the Wong and Law EI scale -WLEIS-S [21], consists of 16 items and 4 dimensions: intrapersonal perception (evaluation of one's own emotions), interpersonal perception (evaluation of the emotions of others), assimilation (use of emotions) and emotional regulation. A 7-point Likert-type scale (1 to 7 points) was used, which has a validity and reliability in Spanish contexts of (α =.91). In our studio, the reliability of this scale was Cronbach's α = .906 and McDonald's ω = .909.

Spanish version of the Resilience Scale (RS-14) [22], which was made by Wagnild [23]. It measures the degree of resilience, considered as a positive personality characteristic that allows the individual to adapt to adverse situations. The RS-14 measures two dimensions: personal competence (11 items, self-confidence, independence, decisiveness, resourcefulness and perseverance) and acceptance of self and life (3 items, adaptability, balance, flexibility and a stable outlook on life). The reliability of this scale was Cronbach's α = .899 and McDonald's ω = .906.

Satisfaction with Life Scale. The Satisfaction with Life Scale -SWLS- [24], specifically the version of the Satisfaction with Life Scale by Vázquez et al. [25], was used to assess life satisfaction. It consists of five items where participants must indicate the degree of agreement or disagreement for each of the response options of the instrument. The scale in the Spanish version reports an internal consistency of α=.82. The reliability of this scale was Cronbach's α = .885 and McDonald's ω = .907.

2.3. Procedure

We followed the ethical guidelines promoted and encouraged by national and international regulations for conducting research with people, following the indications of the Declaration of Helsinki [26]. Informed consent and confidentiality and anonymity of the data obtained were guaranteed for each of the participants. The instruments were administered individually through the platform Google (Google forms). The approximate response time for each subject was 15 minutes. This research has the approval of the Human Research Ethics Committee of the University of Jaén (Spain), ID code OCT.22/2 LINE (Line of Research: "Evaluation of emotions throughout the life cycle").

2.4. Data analysis

Descriptive statistics (means and standard deviations) were obtained. The validity, reliability (Cronbach's alpha and Omega coefficient) and internal consistency of each instrument were analysed a priori through Confirmatory Factor Analysis (CFA) to verify the psychometric properties of the questionnaire and to obtain the factor loadings of each item. The normality analysis was carried out by means of multivariate hypothesis testing (being the distribution of the multivariate normal set, each of the marginal variables will meet the criteria of univariate normality, but not vice versa), which resulted in a normal

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distribution. In relation to the coefficients considered in this study, the Chi-square test (χ^2), the degrees of freedom (gl), and the CFI, GFI, SRMR and RMSEA fit indices were used. In this sense, χ^2 should be understood from the ratio in relation to the degrees of freedom ($\chi 2/gl$). The comparative fit index (CFI) calculates the relative fit of the observed model, whose value should be greater than .90 indicating a good fit. Similarly, the goodness-of-fit index (GFI), above .90, indicates the proportion of variance and covariance of the model data. Similarly, the standardised root mean square residual (SRMR), standardised means of the residuals, i.e. the difference between the observed and model matrix, being less than .10, indicates a good model fit. The root mean square error of approximation per degree of freedom (RMSEA), as a measure of discrepancy, should have results below .08 [27]. A 95% confidence level (significance $p<.05$) was used in all cases. To achieve a better fit for each of the tests, the data were transformed according to their factor loadings [27]. The correlation between the resulting scores of each of the EI dimensions of the WLEIS-S instrument (Appraisal of own emotions, Appraisal of others' emotions, Use of emotions and Emotional Regulation); Resilience (RS-14) and its dimensions (Personal competence and Acceptance of self and life) and Life satisfaction (SWLS) was analysed with Pearson's *r* test. Subsequently, to analyse the differences according to gender (men vs. women), Student's t-test for independent samples was used. For age, the ANOVA test for independent samples was performed. Finally, to explore the predictive value of the Life satisfaction variable, a stepwise regression study was carried out respectively. In all cases a 95% confidence level was used (significance $p<.05$). The analyses were carried out using SPPS Statistics in version 25.0 and jamovi software (The jamovi Project) in Version 1.2.

3. Results

3.1. Descriptive results.

The descriptive values (central tendency and distribution) of the variables that make up the different instruments are also calculated. With respect to skewness and kurtosis, it has been observed that the items of the EI, resilience and life satisfaction dimensions are distributed within the range -2 and 2, according to the criteria established by Bandalos and Finney [28], which presents a good distribution (see Figure 2). The corrected homogeneity index also presents acceptable values above .500.

Bartlett's statistic and the Kaiser-Meyer-Olkin test of sampling adequacy (KMO), reveal a good fit of the data to be subjected to factor analysis, and taking into account the ordinal nature of the data recording (Likert scale from 1 to 7) of the factor extraction in the Exploratory Factor Analysis (EFA), it is convenient to perform it through the robust estimation of unweighted least squares (ULS) and polychoric matrices.

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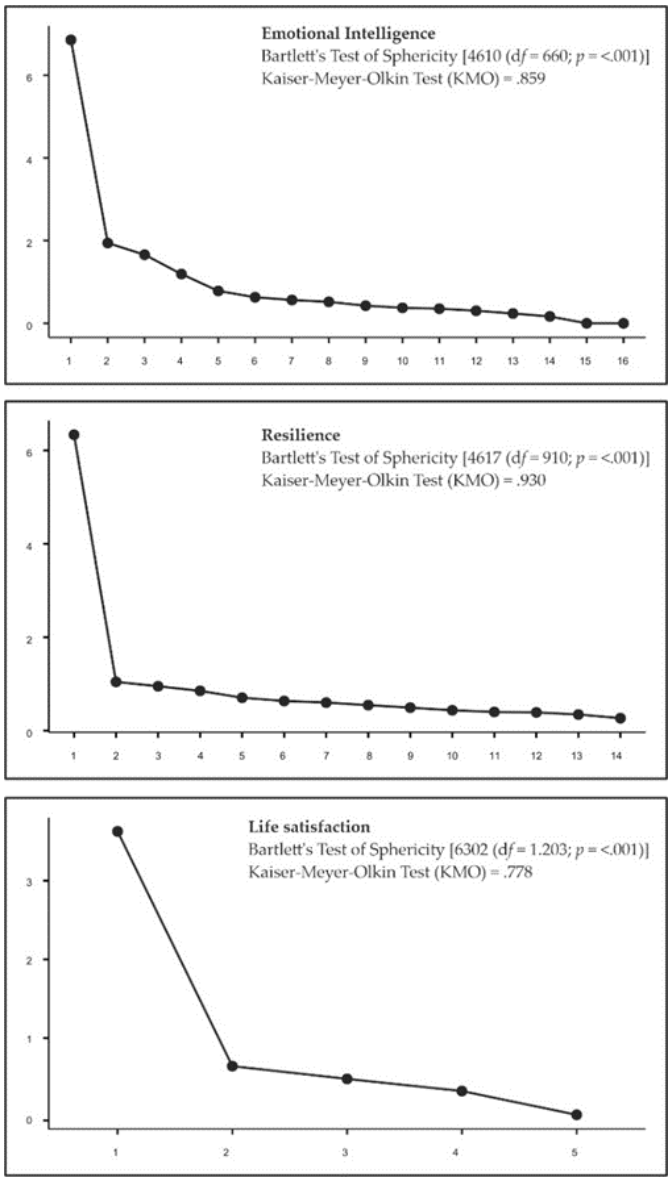

Figure 2. Sedimentation graph (Emotional Intelligence, Resilience and Life satisfaction).

Secondly, we assess whether the data assume the assumption of normality with Mardia's multivariate test to contrast the skewness and kurtosis of the observed variables, which shows that the data follow a normal distribution. The assumptions of multicollinearity, homogeneity and homoscedasticity are analysed to verify that the resulting distribution meets the criteria of dependence between variables.

From the data obtained with each of the instruments (Table 1), a Confirmatory Factor Analysis (CFA) is performed to verify the validity and internal structure of each item. Critical *Z*-score values using a 99% confidence level (standard deviations) will determine a small *p*-value to reflect statistically significant spatial structure in the data.

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Table 1. Factor loadings (WLEIS-S).

Latent Factor	Indicator	*α*	*ω*	Estimate	*SE*	*Z*	*p*	*β*	*AVE*	*CR*
Appraisal of own emotions	Ítem 1	.901	.904	0.731	.0306	23.9	< .001	0.756	.653	.889
	Ítem 2	.897	.900	0.808	.0272	29.8	< .001	0.879		
	Ítem 3	.898	.901	0.790	.0285	27.7	< .001	0.839		
	Ítem 4	.903	.907	0.531	.0348	15.3	< .001	0.533		
Appraisal-of-others'-emot.	Ítem 5	.904	.908	0.731	.0362	20.2	< .001	0.690	.601	.854
	Ítem 6	.904	.908	0.895	.0358	25.0	< .001	0.817		
	Ítem 7	.908	.911	0.589	.0375	15.7	< .001	0.566		
	Ítem 8	.902	.907	0.792	.0323	24.5	< .001	0.809		
Use of emotions	Ítem 9	.903	.907	0.740	.0408	18.1	< .001	0.606	.644	.874
	Ítem 10	.901	.905	0.916	.0409	22.4	< .001	0.715		
	Ítem 11	.897	.902	1.095	.0340	32.2	< .001	0.910		
	Ítem 12	.897	.902	1.065	.0334	31.8	< .001	0.904		
Emotional Regulation	Ítem 13	.897	.901	0.803	.0328	24.5	< .001	0.744	.621	.856
	Ítem 14	.896	.899	1.085	.0274	39.7	< .001	1.000		
	Ítem 15	.896	.899	1.079	.0273	39.6	< .001	0.999		
	Ítem 16	.897	.901	0.731	.0306	23.9	< .001	0.756		

Note: *SE*: Standardised error; *Z*: Z-value at estimation; *p*: *p*-value of *Z*-estimate; *β*: Standardised estimate; AVE: Average variance extracted; CR: Critical ratio.

The factor loadings for the items of the EI scale (WLEIS-S), had an adequate fit [29], $\chi^2/df = 3.259$, with CFI = 0.973, SRMR = .0380, RMSEA = .067. The reliability of this scale was Cronbach's $\alpha = .906$ and McDonald's $\omega = .909$.

Table 2. Factor loadings (RS-14).

Latent Factor	Indicator	*α*	*ω*	Estimate	*SE*	*Z*	*p*	*β*	*AVE*	*RC*
Personal competence	Ítem 1	0.894	.901	0.522	.0300	17.4	< .001	0.589	.613	.885
	Ítem 2	0.892	.899	0.601	.0314	19.2	< .001	0.635		
	Ítem 3	0.891	.899	0.762	.0392	19.4	< .001	0.642		
	Ítem 4	0.886	.894	0.792	.0326	24.3	< .001	0.759		
	Ítem 5	0.897	.903	0.645	.0427	15.1	< .001	0.523		
	Ítem 6	0.893	.900	0.477	.0272	17.5	< .001	0.591		
	Ítem 7	0.895	.902	0.563	.0338	16.6	< .001	0.566		
	Ítem 8	0.886	.893	0.827	.0319	25.9	< .001	0.792		
	Ítem 9	0.892	.899	0.549	.0282	19.5	< .001	0.642		
	Ítem 10	0.890	.898	0.708	.0329	21.5	< .001	0.694		
	Ítem 11	0.889	.895	0.616	.0257	24.0	< .001	0.751		
Acceptance-of-self-life	Ítem 12	0.900	.905	0.656	.0450	14.6	< .001	0.529	.545	.811
	Ítem 13	0.888	.896	0.922	.0391	23.6	< .001	0.813		
	Ítem 14	0.898	.904	0.578	.0415	13.9	< .001	0.505		

Note: *SE*: Standardised error; *Z*: *Z*-value at estimation; *p*: *p*-value of Z-estimate; *β*: Standardised estimate; AVE: Average variance extracted; CR: Critical ratio.

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The factor loadings for the items of the Resilience scale (RS-14), presented an adequate fit [29]; χ^2/df = 2.967; with CFI = 0.911; SRMR = .046; RMSEA = .078. The reliability of this scale was Cronbach's α = .899 and McDonald's ω = .906.

Table 3. Factor loadings (SWLS).

Latent Factor	Indicator	*α*	*ω*	Estimate	*SE*	*Z*	*p*	*β*	*AVE*	*CR*
Life satisfaction	Ítem 1	.835	.859	1.157	.0292	39.7	< .001	.901	.598	.862
	Ítem 2	.859	.894	0.796	.0355	22.4	< .001	.696		
	Ítem 3	.836	.860	1.146	.0290	39.5	< .001	.998		
	Ítem 4	.858	.896	0.753	.0354	21.3	< .001	.668		
	Ítem 5	.918	.922	0.839	.0547	15.3	< .001	.512		

Note: SE: Standardised error; *Z*: Z-value at estimation; *p*: *p*-value of Z-estimate; *β*: Standardised estimate; AVE: Average variance extracted; CR: Critical ratio.

The factor loadings for the items of the Life Satisfaction Scale (SWLS), presented an adequate fit [29]; χ^2/df = 3.041; with CFI = 0.963; SRMR = .034; RMSEA = .068. The reliability of this scale was Cronbach's α = .885 and McDonald's ω = .907.

To analyse each of the variables observed between all the dimensions that constitute the model (See Table 4), the correlation matrix (Pearson's *r*) was developed together with the descriptive statistics (means and standard deviations) and the reliability of the scores (Cronbach's alpha and omega coefficient), with the highest correlation established between Personal competence and Use of emotions (*r*(784)=. 680; *p*<.001); Personal competence and Acceptance of self and life (*r*(784)=.683; *p*<.001); Acceptance of self and life and Life satisfaction (*r*(784)=.611; *p*<.001), with a statistically significant relationship in the rest of the variables.

Table 4. Internal consistency, mean, standard deviation and the Pearsons r correlation.

Variable	*α*	*ω*	*M (SD)*	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Appraisal of own emotions (1)	.849	.864	5.99(±.78)	-						
Appraisal of others' emotions (2)	.876	.887	5.46(±.83)	.403***						
Use of emotions (3)	.847	.860	5.60(±1.03)	.548***	.314***					
Emotional Regulation (4)	.853	.867	5.54(±1.01)	.524***	.331***	.471***				
Personal competence (5)	.838	.845	5.98(±.68)	.602***	.470***	.680***	.562***			
Acceptance of self and life (6)	.838	.853	5.67(±.88)	.550***	.330***	.628***	.634***	.683***		
Life satisfaction (7)	.857	.869	5.23(±.1.04)	.471***	.309***	.509***	.445***	.611***	.537	-

Note: (1) *M*=Mean, *SD*=Standard deviation. (2) *** *p*< .001.

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3.2. Differences according to socio-demographic variables

To determine the difference in means in relation to the gender variable, the Student's t-test for independent samples was used (see Table 5).

Table 5. Differences in means according to gender (Student's t-test).

Variables	Men (*n*=591) *M (SD)*	Women (*n*=193) *M (SD)*	$t_{(784)}$	*p*	Effect *(d)*	95% CI Lower	95% CI Upper
Appraisal of own emotions	5.98 (±.75)	6.00 (±.84)	-.337	.706	-.0313	-.15169	.1028
Appraisal of others' emotions	5.38 (±.84)	5.70 (±.74)	4.664	< .001***	-.3867	-.45136	-.1840
Use of emotions	5.64 (±.96)	5.46 (±1.20)	2.182	.029*	.1809	.01864	.3529
Emotional Regulation	5.60 (±.97)	5.36 (±1.08)	2.888	.004**	.2394	.07705	.4041
Personal competence	5.96 (±.66)	6.00 (±.73)	-.638	.524	-.0529	-.14745	.0751
Acceptance of self and life	5.70 (±.84	5.57 (±.97)	1.853	.064	.1537	-.00800	.2786
Life satisfaction	5.21 (±1.01)	5.31 (±1.11)	1.139	.255	-0.0944	-.26762	.0711

Note: (1) *M*= Mean, *SD*= Standard deviation. (2) * p< .05, ** p< .01, *** p< .001. (3) The statistical effect size is expressed as Cohen's *d* value.

The results (see Table 5 and Figure 3) indicate that there are only significant differences in the EI variables: Use of emotions (t_{784}=2.182; p<.001); Emotional Regulation (t_{784}=2.888; p<.05), where the scores obtained are higher in men than in women; and Appraisal of others' emotions (t_{784}=4.664; p<.05), where the scores are higher in women. There are also significant differences in the Resilience variable, Acceptance of self and life (t_{784}=1.853; p<.05), with higher values in men.

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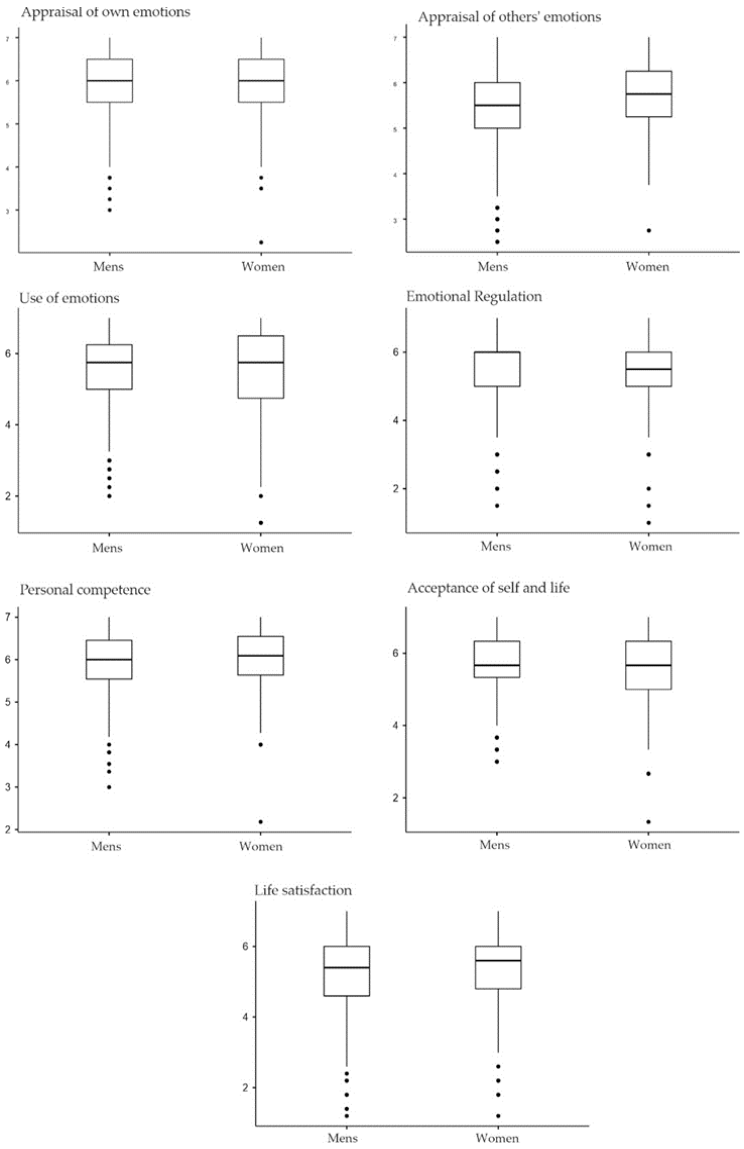

Figure 3. Mean differences according to gender (mens vs. women) in each dimension.

Three age intervals (18-37 years, 28-57 years and 58-76 years) were established in order to test the homogeneity of the covariance matrices for the variable age of the participants, and ANOVA tests were carried out (see Table 6 and Figure 4).

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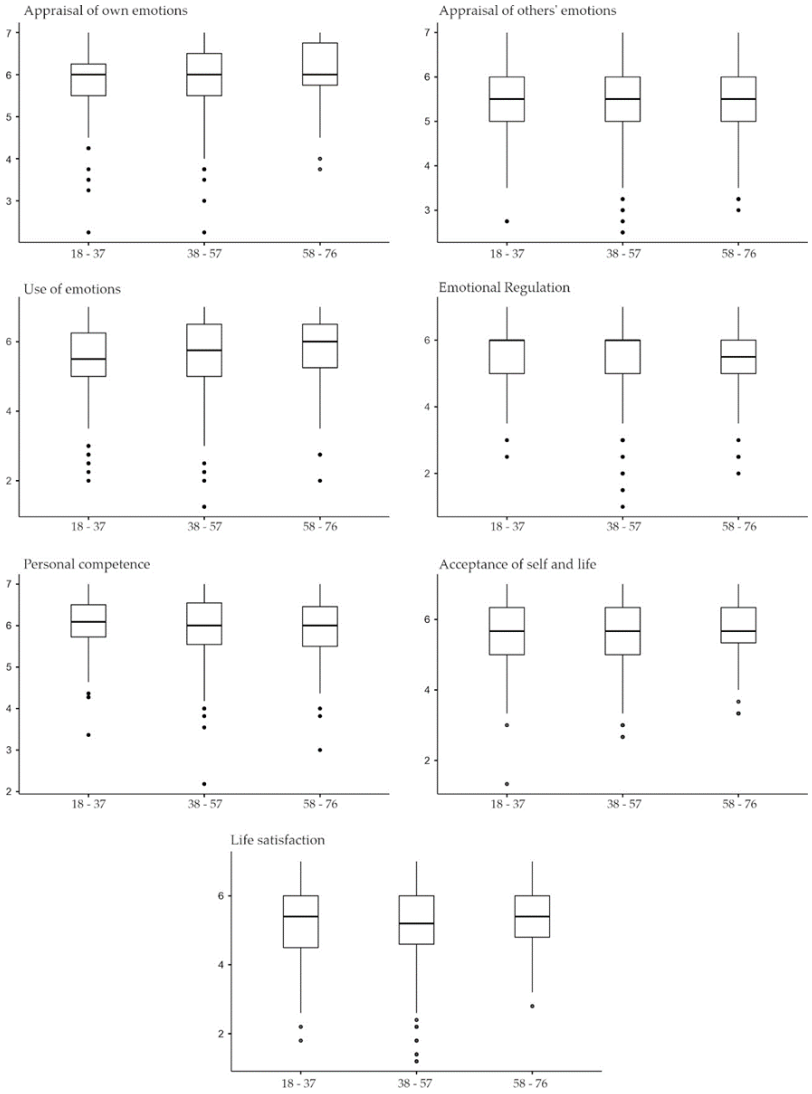

Figure 4. ANOVA according to age in each dimension.

Statistically significant differences were found in the EI dimensions Appraisal of own emotions ($F_{(2-784)}$=.5.036; p= .007) and Use of emotions ($F_{(2-784)}$=6.196; p= .002), with higher values for older participants (58-76 years). Significant differences were also found for Life satisfaction ($F_{(2-784)}$=3.191; p= .042).

Table 6. Differences in means according to age (ANOVA).

Variable	18-37 years M (SD)	38-57 years M (SD)	58-76 years M (SD)	F(784)	p	Effect η^2
Appraisal of own emotions	5.84 (±.80)	5.98 (±.80)	6.09 (±.69)	5.036	.007**	.012
Appraisal of others' emotions	5.51 (±.86)	5.43 (±.83)	5.47 (±.79)	0.563	.570	.001
Use of emotions	5.46 (±1.13)	5.54 (±1.07)	5.77 (±.83)	6.196	.002**	.013
Emotional Regulation	5.63 (±.91)	5.51 (±1.04)	5.51 (±1.00)	.864	.422	.002
Personal competence	6.06 (±.62)	5.96 (±.70)	5.94 (±.68)	1.643	.195	.004
Acceptance of self and life	5.59 (±.95)	5.65 (±.89)	5.74 (±.82)	1.522	.220	.004
Life satisfaction	5.22 (±1.07)	5.16 (±1.11)	5.36 (±.87)	3.191	.042*	.007

Note: (1) M= Mean, SD= Standard deviation. (2) * p< .05, ** p< .01. (2) The effect size is expressed as the Eta squared value (η^2).

Tukey's HSD test shows significant differences between participants aged 58-76 years. The effect size is small in all cases (η^2).

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3.3. Linear regression model (step-by-step).

To determine the degree of functional relationship between the variables, a linear regression analysis was carried out, including Life satisfaction as a dependent variable together with the rest of the research variables, which were entered step by step following the theoretical model proposed (see Table 7).

The main contribution is distributed as follows: Appraisal of own emotions (β=.104; p<.001); Use of emotions (β=.30; p<.001); Emotional Regulation (β= .103; p<.001), Personal competence (β=.402; p<.001), which present an adequate level of significance and explain positively the regression model by 44.1%. Appraisal of others' emotions was significant in the initial steps of the analysis, but then lost its significance. Similarly, the variable Acceptance of self and life did not enter the regression model.

Table 7. Linear regression analysis from the dependent variable Life satisfaction.

Life Satisfaction					
Model	***B***	***β***	***t***	***R^2 corrected***	***p***
Step 1					
Appraisal of own emotions	.629	.471	14.959	.221	<.001***
Step 2					
Appraisal of own emotions	.553	.414	12.150	.237	<.001***
Appraisal of others' emotions	.179	.142	4.184		<.001***
Step 3					
Appraisal of own emotions	.321	.240	6.533	.319	<.001***
Appraisal of others' emotions	.130	.104	2.202		<.001***
Use of emotions	.350	.345	9.727		<.001***
Step 4					
Appraisal of own emotions	.238	.178	4.657	.340	<.001***
Appraisal of others' emotions	.104	.083	2.573		<.001***
Use of emotions	.304	.300	8.330		<.001***
Emotional Regulation	.189	.183	5.138		<.001***
Step 5					
Appraisal of own emotions	.139	.104	2.828	.441	<.001***
Use of emotions	.132	.130	3.361		<.001***
Emotional Regulation	.106	.103	2.946		<.001***
Personal competence	.614	.402	9.549		<.001***

Note: (1) *** p<.001.

4. Discussion and conclusions

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The aim of the research was to evaluate the relationship between each of the dimensions of EI (Appraisal of own emotions, Appraisal of others' emotions, Use of emotions and Emotional Regulation), resilience (Personal competence, Acceptance of self and life) and Life satisfaction; and to analyse these associations according to gender and age in mountain and climbing athletes (FEDME), who have taken some formal training in this discipline. The results showed a statistically significant correlation between the dimensions of EI, resilience and life satisfaction, which is consistent with different studies that highlight the benefits of physical activities in the mountains as generators of positive emotions and greater satisfaction with life. This statement is confirmed by studies already conducted on emotions [17,30,31], where physical exercise is a key factor in the increase of serotonin and dopamine that affect emotional state and psychological well-being [18,32]. Similarly, some studies show that satisfying basic psychological needs increases task involvement and effort, which favours internal motivational states [33,34]. From another perspective, Frochot et al. [17] analysed the satisfaction of mountain sports and the subjective well-being produced by this activity in mountain contexts, achieving similar findings to those presented in our study.

The results show significant differences between each of the dimensions of the instruments considered and the socio-demographic variable gender. The results show higher values for women than men in two of the dimensions of EI, on the emotional perception of self and others, and also in the dimension of resilience, personal competence and life satisfaction. However, these results should be taken under caution, as the proportion is higher for women than for men. Different studies corroborate these data, as women practice mountain activities less than men, data that are consistent with global sport statistics [35,36]. Likewise, Salmela-Aro et al. [1], show that women manage their emotions slightly better than men, in agreement with Acebes et al. [37]. Other research such as that of Doyle and Thompson [38] corroborate in their research on stereotypes and EI, better data in men, although they argue that these results may be conditioned by stereotypes generated over time.

In relation to age, significant differences were found in older participants. This is corroborated by other research which argues that as people progress through the different stages of life, different physical, psychological and social changes occur [39], which have an impact on their well-being. Older people may have greater control, emotional maturity and adaptive response than middle-aged people. Similarly, older people use emotional regulatory strategies depending on the obstacles they face [40].

As for the regression analysis, the dimensions predicting greater life satisfaction were Appraisal of own emotions, Use of emotions, Emotional Regulation and Personal competence, i.e., people with high levels of EI are more aware of their emotions and have more developed skills to manage them effectively, which in turn can help them to adapt better to difficult situations [41]. In addition, resilience and EI may contribute to greater life satisfaction. More resilient individuals are able to face and overcome challenges more easily, which may help them feel more confident and able to achieve their goals, which in turn may contribute to greater life satisfaction [15]. This approach provides significant evidence in relation to other research where high scores on Appraisal of own emotions and Emotional Regulation positively and significantly predict higher levels of subjective well-being and better adaptive processes [8,9], or the influence of EI on performance in mountain sports and climbing [10,11].

This study has some limitations. Firstly, it is a descriptive cross-sectional study, which implies that causal relationships between variables cannot be estimated, as well as the bias of dealing with mountain and climbing sportsmen and women nationwide. Secondly, although the sample is large, it is necessary to extend it, as well as to be able to carry out longitudinal or generational studies. Thirdly, the number of participants, mostly men, may have influenced the results found, so caution should be exercised in the generalisation of these data to the general population. Finally, it is suggested that the evaluation of social desirability be considered for future research.

Consistent with the results obtained, we can point out that each of the dimensions of EI and resilience are variables of psychological adjustment associated with well-being [42], key to personal and social growth [43], adaptive processes and personal competence [44].

The results of this research make two main contributions: on the one hand, it shows a statistical relationship between the dimensions of EI, resilience and life satisfaction in mountain and climbing athletes, which reinforces the proposal to analyse the emotional benefits and development of strategies for the development of EI and resilience; and suggests the need to extend the benefits at an early age and more specifically in the training of practitioners of this discipline. On the other hand, this study points to the need to increase the number of studies that respond to the questions about gender, emotional competencies and sports performance in mountain and climbing disciplines.

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References

1. Salmela-Aro, K.; Hietajärvi, L.; Lonka, K. Work Burnout and Engagement Profiles Among Teachers, **2019**, *Frontiers in psych*., *10,* 2254. https://doi.org/10.3389/fpsyg.2019.02254
2. Salanova, M. (2021). Resiliencia. ¿Cómo me levanto después de caer? PRISA editors: Madrid, Spain, **2021.**
3. Tabibnia G. An affective neuroscience model of boosting resilience in adults. *Neuros. and Biobeha. Reviews*, **2020**, *115,* 321-350. https://doi.org/10.1016/j.neubiorev.2020.05.005
4. Méndez-Alonso, D.; Prieto-Saborit, J. A.; Bahamonde, J. R.; Jiménez-Arberás, E. Influence of Psychological Factors on the Success of the Ultra-Trail Runner. *I. J. of Environ. Res. and Public Health,* **2021**, *18*(5), 2704. http://dx.doi.org/10.3390/ijerph18052704
5. Niedermeier, M.; Frühauf, A.; Kopp, M. Intention to Engage in Mountain Sport During the Summer Season in Climate Change Affected Environments. *Frontiers, Public Health*, **2022**, *10,* 828405. https://doi.org/10.3389/fpubh.2022.828405
6. Habelt, L.; Kemmler, G.; Defrancesco, M.; Spanier, B.; Henningsen, P.; Halle, M.; Sperner-Unterweger, B.; Hüfner, K. Why do we climb mountains? An exploration of features of behavioural addiction in mountaineering and the association with stress-related psychiatric disorders. *European Archives of Psychi. and Clin. Neuros.*, **2022**, 1-9. https://doi.org/10.1007/s00406-022-01476-8
7. Petrides, K. V.; Frederickson, N.; Furnham, A. The Role of Trait Emotional Intelligence in Academic Performance and Deviant Behavior at School. *Personality and Individual Differences*, **2004**, *36,* 277-293. http://dx.doi.org/10.1016/S0191-8869(03)00084-9
8. Castro-Sánchez, M., Lara-Sánchez, A. J., Zurita-Ortega, F., & Chacón-Cuberos, R. (2019). Motivation, Anxiety, and Emotional Intelligence Are Associated with the Practice of Contact and Non-Contact Sports: An Explanatory Model. *Sustainability*, **2019**, *11*(16), 4256. http://dx.doi.org/10.3390/su11164256
9. Nicolas, M.; Martinent, G.; Millet, G.; Bagneux, V.; Gaudino, M. Time courses of emotions experienced after a mountain ultra-marathon: Does emotional intelligence matter? *J. of Sports Sciences,* **2019**, *37*(16), 1831-1839. https://doi.org/10.1080/02640414.2019.1597827

10. Laborde, S.; Dosseville, F.; Allen, M. S. Emotional intelligence in sport and exercise: A systematic review. Scandinavian Journal of Medicine & Science in Sports, **2015**, 26(8), 862-874. https://doi.org/10.1111/sms.12510
11. Garrido-Palomino, I.; España-Romero, V. Role of emotional intelligence on rock climbing performance. *Rev. I. de Ciencias del Deporte*, **2019**, *15*(57), 284-294. https://doi.org/10.5232/RICYDE2019.05706
12. Biswas-Diener, R. Wellbeing research needs more cultural approaches. *I. J. of Wellbeing*, **2022**, *12*(4), 20-26. https://doi.org/10.5502/ijw.v12i4.1965
13. Próchniak, P.; Próchniak, A. Future-Oriented Coping with Weather Stress among Mountain Hikers: Temperamental Personality Predictors and Profiles. *Behavioral Sciences*, **2021**, *11*(2), 15. https://doi.org/10.3390/bs11020015
14. Próchniak, P. Profiles of Wellbeing in Soft and Hard Mountain Hikers. *I. J. of Environ.Res. and Public Health*, **2022**, 19(12), 7429. http://dx.doi.org/10.3390/ijerph19127429
15. Extremera, N.; Rey-Peña, L.; Sánchez-Álvarez, N. Validation of the Spanish version of the Wong Law emotional intelligence scale (WLEIS-S). *Psicothema*, **2019**, *31*(1), 94-100. https://doi.org/10.7334/psicothema2018.147
16. Gavín-Chocano, Ó.; García-Martínez, I.; Pérez-Navío E.; Molero, D. Resilience as a mediating variable between emotional intelligence and optimism-pessimism among university students in Spanish universities. *Journal of Further and Higher Educa.*, **2022**. https://doi.org/10.1080/0309877X.2022.2133994
17. Frochot, I.; Elliot, S.; Kreziak, D. Digging deep into the experience – flow and immersion patterns in a mountain holiday. *I. J. of Culture Tourism and Hospit. Res.*, **2017**, *11*(1), 81-91. https://doi.org/10.1108/ijcthr-09-2015-0115
18. Schebella, M. F.; Weber, E.; Schultz, L.; Weinstein, P. The wellbeing benefits associated with perceived and measured biodiversity in Australian urban green spaces. *Sustainability*, **2019**, *11*(3), 802. https://doi.org/10.3390/su11030802
19. Valladares, F. More biodiversity to improve our health: The benefits to human well-being of favouring functional and diverse ecosystems. *Metode Science Studies J.*, **2022**. https://doi.org/10.7203/metode.14.24072
20. Engemann, K.; Pedersen, C. B.; Arge, L.; Tsirogiannis, C.; Mortensen, P. B.; Svenning, J. Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood. *PNAS*, **2019**, *116*(11), 5188–5193. https://doi.org/10.1073/pnas.1807504116
21. Wong, C. S.; Law, K. S. The effects of leader and follower emotional intelligence on performance and attitude: an exploratory study. *Leadership Quartely*, **2002**, *13*, 243-274. http://dx.doi.org/10.1016/S1048-9843(02)00099-1
22. Sánchez-Teruel, D.; Robles-Bello, M. A. Escala de resiliencia 14 ítems (RS-14): propiedades psicométricas de la versión en español. *Rev. Iberoam. de Diagn. y Evaluación-e Avaliação Psicol.*, **2015**, *2*(40), 103-113.
23. Wagnild, G. A Review of the Resilience Scale. *J. of Nursing Measurement*, **2009**, *17*(2), 105-113. https://doi.org/10.1891/1061-3749.17.2.105
24. Diener E.; Emmons, R.; Larsen, R. J.; Griffin S. The Satisfaction with Life Scale. *J. of Personality Assessment*, **1985**, *49*, 71-75. https://doi.org/10.1207/s15327752jpa4901_13
25. Vázquez, C.; Duque, A.; Hervás, G. Satisfaction with Life Scale in a Representative Sample of Spanish Adults: Validation and Normative Data. *Spanish J. of Psych.*, **2013**, *16*(82), 1-15. https://www.ncbi.nlm.nih.gov/pubmed/24230945
26. WMA. *Declaration of Helsinki. Ethical Principles for Medical Research on Human Beings* (2013 October). 64th General Assembly, Fortaleza (Brazil). Retrieved from https://www.wma.net/wp-content/uploads/2016/11/DoH-Oct2013-JAMA.pdf
27. Kline, R. *Principles and practice of structural equation modeling*. New York, USA: Guilford Press, **2015**.
28. Bandalos, D.L.; Finney, S.J. *Factor analysis: Exploratory and confirmatory*. En G. R. Hancock y R. O. Mueller (Eds.), Reviewer's guide to quantitative methods. New York, USA: Routledge, **2010**.
29. Hair, J. F.; Sarstedt, M.; Ringle, C.M.; Gudergan, S. P.; Castillo-Apraiz, J.; Cepeda-Carrión, G.A.; Roldán, J. L. *Manual Avanzado de Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Omnia Science, **2021**.
30. Muñoz-Arroyave, V.; Lavega-Burgués, P.; Costes, A.; Damian, S.; Serna, J. Los juegos motores como recurso pedagógico para favorecer la afectividad desde la educación física. *Retos. Nuevas tendencias en Educación Física, Deporte y Recreación*, **2020**, *38*, 166-172. https://doi.org/10.47197/retos.v38i38.76556
31. Pic, M.; Lavega-Burgués, P.; Muñoz-Arroyave, V.; March-Llanes, J.; Echeverri-Ramos, J. A. Predictive variables of emotional intensity and motivational orientation in the sports initiation of basketball. *Cuadernos de Psicología Del Deporte*, **2019**, *19*(1), 241-251. https://doi.org/10.6018/cpd.343901
32. Bisquerra, R. *Universo de emociones.* Valencia, Spain: PalauGea, **2018**.
33. Moreno, J.A.; Hellín, G. El interés del alumnado de Educación Secundaria Obligatoria hacia la Educación Física. REDIE, *Rev.Electr.de Investig. Educ.*, **2007**, *9*(2), 0. http://redie.uabc.mx/vol9no2/contenido-moreno.html
34. Niubò-Solé, J.; Lavega-Burgués, P.; Sáenz-López, P. Emotions According to Type of Motor Task, Sports and Gender Experience. *Apunts Educación Física y Deportes*, **2022**, 148. 26-33. https://doi.org/10.5672/apunts.2014-0983.es.(2022).148.04
35. Martín-Talavera, L.; Mediavilla-Saldaña, L. Gender differences in the profile and habits of practitioners of outdoor activities. *Retos*, **2020**, *38*, 713-718. https://doi.org/10.47197/retos.v38i38.78499
36. Espada, M.; Martín, M.; Jiménez, V.; Moscoso, D.; Jiménez-Beatty, E.; Rivero, A. Leisure sports habits in Spanish adults: gender and social differences. *Revista de Ciencias Sociales*, **2018**, *13*(2), 495- 513. https://doi.org/10.14198/OBETS2018.13.2.02
37. Acebes-Sánchez, J., Diez-Vega, I., Esteban-Gonzalo, S, & Rodriguez-Romo, G. (2019). Physical activity and emotional intelligence among undergraduate students: a correlational study. BMC Public Health, 19,1241 https://doi.org/10.1186/s12889-019-7576-5
38. Doyle, R. A.; Thompson, A. E. The influence of stereotype threat and implicit theories of emotion on gender differences in emotional intelligence. *The J. of Men's Studies*, **2021**, *29*(2), 131-155. https://doi.org/10.1177/1060826520920878

39. Bernaras, E.; Jaureguizar, J.; Soroa, M.; Ibabe, I.; Cuevas, C. Child depression in the school context. *Procedia-Social and Behavioral Sciences*, **2011**, *29*, 198-207. https://doi.org/10.1016/j.sbspro.2011.11.225
40. Pulido-Acosta, F.; Herrera-Clavero, F. Relaciones entre rendimiento e inteligencia emocional en secundaria. *Tendencias Pedagógicas*, **2018**, *31*, 165-186. https://doi.org/10.15366/tp2018.31.010
41. Cejudo, J.; López-Delgado, M. L.; Rubio, M. J. Inteligencia emocional y resiliencia: su influencia en la satisfacción con la vida en estudiantes universitarios. *Anuario de Psicología*, **2016**, *46*(2), 51.57. https://doi.org/10.1016/j.anpsic.2016.07.001
42. Guevara, R. M.; Moral-García, J. E.; Urchaga, J. D.; López-García, S. (2021). Relevant Factors in Adolescent Well-Being: Family and Parental Relationships. *I. J. of Environ. Res.and Public Health*, **2021**, *18*(14), 7666. http://dx.doi.org/10.3390/ijerph18147666
43. Baumsteiger, R.; Hoffmann, J.D.; Castillo-Gualda, R.; Brackett, M. A. Enhancing school climate through social and emotional learning: effects of RULER in Mexican secondary schools. *Learning Environ. Res.*, **2022**, *25*, 465-483. https://doi.org/10.1007/s10984-021-09374-x
44. Brackett, M. A.; Bailey, C. S.; Hofmann, J. D.; Simmons, D. N. RULER: A theory-driven, systemic approach to social, emotional, and academic learning. *Educational Psychologist*, **2019**, *54*, 144-161. https://doi.org/10.1080/00461520.2019.1614447