PHYSICAL ACTIVITY INTERVENTION PROGRAM IN NATURE WITH UNIVERSITY STUDENTS UNDER COVID-19 MOBILITY RESTRICTIONS

Samuel Molina-Salmerón[1]
Josué Rubén González-Ruiz[2]
Julio Fuentesal-García[1]
Aylin Fernández-Ortiz[2,3]
Raul Baños[2]✉

[1]Polythecnic University of Madrid, Spain

[2]University of Granada, Spain

[3]Autonomous University of Nuevo León, Mexico

✉ banos@ugr.es

ABSTRACT

Objective: This study aimed to evaluate the effects of a physical-sports activity program in nature on life satisfaction, emotional intelligence, and anxiety in university students during COVID-19 mobility restrictions.

Methods: a controlled trial was conducted involving 40 students from the Faculty of Sport Sciences, randomly assigned to either an experimental group (EG; *n* = 20) or a control group (CG; *n* = 20). The EG participated in an intervention program based on outdoor physical sports activities, while the CG did not engage in any additional activities. The intervention was implemented within the context of restrictions imposed by the COVID-19 pandemic, and assessments were conducted before (pre-test) and after (post-test) the program.

Results: the analyses revealed statistically significant improvements in the experimental group in life satisfaction, emotional attention, and state anxiety compared to the control group. No significant differences were found in emotional clarity, emotional repair, or trait anxiety.

Conclusion: the results suggest that engaging in physical sports activities in nature, even under confinement circumstances, positively affects life satisfaction and certain aspects of emotional intelligence and anxiety in university students.

KEYWORDS

Anxiety, emotional intelligence, life satisfaction, physical activity, natural environment, and mountaineering

HOW TO CITE

Molina-Salmerón S., González-Ruiz J. R., Fuentesal-García J., Fernández-Ortiz A., Baños R. (2025) 'Physical Activity Intervention Program in Nature with University Students Under COVID-19 Mobility Restrictions', *Journal on Efficiency and Responsibility in Education and Science*, vol. 18, no. 1, pp. 13–24. http://dx.doi.org/10.7160/eriesj.2025.180102

Article history
Received
November 5, 2024
Received in revised form
February 23, 2025
Accepted
March 2, 2025
Available on-line
March 31, 2025

Highlights

- *The study evaluated the effects of a nature-based physical activity program on university students during COVID-19 mobility restrictions.*
- *Participants in the experimental group showed significant improvements in life satisfaction, emotional attention, and reduced state anxiety.*
- *No significant differences were found in emotional clarity, emotional repair, or trait anxiety between the experimental and control groups.*
- *Findings highlight the psychological benefits of physical activity in natural environments during periods of confinement and stress.*
- *Universities are encouraged to implement nature-based physical activity programs to enhance students' psychological well-being.*

INTRODUCTION

The recent global situation experienced by society in relation to the COVID-19 pandemic led to serious confinement restrictions that have generated significant consequences for people's psychological health. Several studies corroborate the emergence of different psychological conditions in a large part of the population [Liu et al., 2020; Moreno-Proaño, 2020; Nicolini, 2020]. Among the psychological variables on which the influence of confinement has been focused are stress, anxiety, depression, emotional intelligence, and dissatisfaction with life, among others [Prieto-Molinari et al., 2020; Cedeño et al., 2020].

Life Satisfaction

Satisfaction with life (SWL) is a global assessment of the achievements obtained and what remains for us to obtain throughout life (Cassà et al., 2018). The Theory of the Subjective Well-being of Diener and Emmons (1985) is one of the theories that analyze the satisfaction with the life of individuals. This construct is composed of two dimensions: the dimension cognitive and the dimension affective. Of this form, the perception of the subjective well-being of a subject will depend on the combination of the cognitive process (perceptions of dissatisfaction and satisfaction in life) and of two affective processes (affect negative and positive), according to Diener and Emmons (1985).

"In this context, the Covid-19 pandemic has caused a decrease in the satisfaction with the life of university students (Krause et al., 2021; Nikolis et al., 2021; Rettew et al., 2021). The scientific literature has examined the activities that the students carried out in their free time to cope with the emergency situation, seeking to improve their general psychological well-being." Thus, activities such as listening to music, practicing yoga and meditation, engaging in physical activity and sports (PAS), Watching movies or series, and engaging in virtual socialization were among the resources most frequently employed by students to enhance their life satisfaction during the pandemic (Bartos et al., 2021; Finnerty et al., 2021; Krause et al., 2021). Of these PAS, outdoor physical activity emerged as the most desired activity. Indeed, several studies have shown that engaging in PAS improved life satisfaction during this period (Faulkner et al., 2020; Ha et al., 2022;). Furthermore, recent research highlights that emotional skills such as emotional management and regulation play a significant role in increasing life satisfaction and facilitating more adaptive responses to adverse situations. However, to date, no studies have analyzed subjective well-being in university students following a PAS intervention program in a natural environment during the COVID-19 pandemic.

Emotional Intelligence

Emotional intelligence is defined by Salovey and Mayer (1997) as "the ability to perceive, appraise, and express emotions accurately; the ability to access and/or generate feelings that facilitate thought; the ability to understand emotions and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth." For Goleman (2008), the term emotional intelligence is understood as the capacity to self-motivate, regulate our emotional states, and attempt to prevent distress caused by a problem from hindering daily life, further encompassing the ability to trust and empathize with others. Emotional intelligence can be studied through three factors, according to Salovey and Mayer (1997), which are emotional attention, defined as the attentiveness we pay to our own emotional states; emotional clarity, which consists of understanding our feelings; and lastly, emotional repair, which is the ability to address and ameliorate negative emotional states. During the pandemic, emotional intelligence was negatively associated with various psychological disorders in university students. In fact, those students with higher levels of emotional intelligence not only reported lower stress levels but also demonstrated greater psychological well-being, self-control, and emotional regulation (García-Álvarez et al., 2021; Kökçam et al., 2022), aiding in the development of more effective study habits during periods of lockdown. Furthermore, individuals who participated in a program focused on enhancing emotional intelligence during the lockdown and pandemic period exhibited lower levels of state anxiety (SA), depression, and suicidal ideation (Persich et al., 2021). Similarly, research has shown that individuals who maintained a healthy lifestyle (e.g., engaging in physical activity, consuming a healthy diet, obtaining adequate sunlight exposure, among others) during the COVID-19 pandemic experienced reduced anxiety levels and increased levels of emotional intelligence and life satisfaction (Sfeir et al., 2022). However, we believe that the scientific literature regarding the implementation of PAS and its impact on the emotional intelligence of university students is limited. To our knowledge, no studies have implemented a PAS nature-based in this population.

It is interesting to mention that research conducted prior to the pandemic already demonstrated a relationship between PAS in nature and emotional intelligence, with physically active university students scoring higher in emotional clarity and repair than their more sedentary counterparts (Ozcorta et al., 2015; Vaquero-Solís et al., 2020). Engaging in PAS within a natural environment presents a greater challenge and sense of adventure, generating distinct sensations that lead to an increase in adrenaline. This occurs within a more dynamic and uncertain environment, where individuals can learn to better manage emotions and confront potentially complex situations in the future (De la Torre, 2018). In this way, individuals with higher emotional intelligence often simultaneously possess a greater connection to nature (Villegas et al., 2016).

Anxiety

According to Spielberger (1966t), anxiety is an unpleasant emotional reaction produced by an external stimulus that the individual perceives as threatening, leading to physiological and behavioral changes in the subject. Furthermore, according to this author, a distinction can be made between state anxiety (SA) and trait anxiety (TA). SA, defined as a transient, temporary state within the human organism, is characterized by subjectively perceived feelings of tension and by hyperactivity of the autonomic nervous system. In contrast, TA refers to a more stable and enduring disposition over time, producing an anxious propensity in individuals to perceive situations as threatening, elevating their SA.

The COVID-19 pandemic led to many university students experiencing high levels of SA and TA, resulting in an increase in negative emotions and a reduction in levels of academic self-efficacy (Alemany-Arrebola et al., 2020), in addition to high levels of academic burnout (Fernández-Castillo, 2021 Along these lines, students who engaged in higher levels of PAS experienced reduced levels of SA (Amekran & El Hangouche, 2022 Several studies conducted with adult populations in different countries worldwide found that individuals who engaged in PAS during the pandemic showed lower levels of SA (Frontini et al., 2021; Meira et al., 2020; Reigal et al., 2021). Furthermore, Frontini et al. (2021) suggested that reducing TA required decreasing SA by increasing levels of PAS during the pandemic. It is worth noting

that research conducted before the pandemic already demonstrated that engaging in PAS reduced levels of both SA and TA (Herrera et al., 2013; McMahon et al., 2016). Moreover, even greater benefits can be achieved if this PAS is performed in a natural environment. It has been shown that outdoor activities provide greater feelings of revitalization, enhancing psychological well-being (Alkahtani, 2019; Byrka & Ryczko, 2018; Daviu-Fuster, 2020; Legrand, 2018; Olafsdottir et al., 2018).

Purpose of the Study

Scientific literature has demonstrated that PAS can improve our anxiety levels (both state and trait), emotional intelligence (attention, clarity, and repair), and life satisfaction. However, analyzing what changes may occur in these psychological variables after implementing a nature-based PAS program during a pandemic and lockdown situation would be interesting. Therefore, this study aims to evaluate the effects of a nature-based PAS program on life satisfaction, emotional intelligence, and anxiety in university students during COVID-19 mobility restrictions. Based on the reviewed literature, the following hypotheses are generated from the objective of this study:

- Hypothesis 1 (H1): Participation in the nature-based physical activity program will increase life satisfaction levels in participants.
- Hypothesis 2 (H2): Participation in the nature-based physical activity program will increase emotional intelligence scores in participants.
- Hypothesis 3 (H3): Participation in the nature-based physical activity program will decrease levels of both SA and TA in participants.

METHOD

This study, titled "Physical Activity Intervention Program in Nature During Times of COVID-19," was reported following the CONSORT checklist guidelines.

Design

A quasi-experimental design was employed with university students, establishing two groups: an experimental group (EG) consisting of students enrolled in the Mountaineering course at the Faculty of Sport Sciences and a control group (CG) consisting of students from the Faculty of Sport Sciences not enrolled in the Mountaineering course. These two groups were established to investigate whether there were differences between sports science students who were going to participate in a nature-based PAS intervention program and those who were not but belonged to the same faculty.

In early February 2021, as in-person classes gradually resumed amidst a nationwide lockdown in Spain, an invitation to participate in a scientific study was extended to the student community of the Faculty of Sport Sciences. In mid-February, participants were informed that the study pertained to the analysis of various psychological variables during the COVID-19 pandemic. No further details were provided, nor were the purpose or objectives of the study disclosed, thereby blinding participants to the study's hypotheses. The first measurement was conducted in the third week of February. The intervention program was implemented in mid-March 2021, with the second measurement taking place immediately upon completion of the program.

Inclusion and Exclusion Criteria

Table 1 shows the number of subjects who participated in the study: 40 people, 17 women (M_{age} = 22.88; SD = 1.32) and 23 Men (M_{age} = 22.13; SD = 1.29). A total of 20 students participated in the EG (M_{age} = 22.25; SD = 1.45) of whom 7 met the selection criteria (M_{age} = 22.71; SD = 1.50) and 13 boys (M_{age} = 22.00; SD = 1.41). The CG sample was made up of a total of 20 participants (M_{age} = 22.65; SD = 1.23), 10 irls (M_{age} = 23.00; SD = 1.25), and 10 boys (M_{age} = 22.30; SD = 1.16).

	Sex	No. of participants	*M*	*SD*
Total	Girls	17	22.88	1.32
	Boys	23	22.13	1.29
EG	Girls	7	22.71	1.50
	Boys	13	22.00	1.41
CG	Girls	10	23.00	1.25
	Boys	10	22.30	1.16

Table 1: Participant Distribution (2022)

Inclusion and Exclusion Criteria

Recruited participants had to meet the prerequisite of being undergraduate students at the Faculty of Sport Sciences and provide signed informed consent. This requirement established two selection criteria for participants depending on the study group (EG, CG). As a general criterion, responding to only one of the measurements (pre-test or post-test) resulted in exclusion, as participation in both was mandatory. Figure 1 illustrates the specific criteria for each study group:

- EG: As an inclusion criterion, participants in this group had to be undergraduate students at the Faculty of Sport Sciences enrolled in the elective Mountaineering course and willing to participate in a 5-day multi-adventure trip in Huelva involving physical activity in a natural environment. Participation in this trip was not mandatory. Three of the 23 volunteers initially intending to participate in the 5-day activity withdrew. Two tested positive for COVID-19 or were required to self-isolate due to contact with a positive individual in the days preceding the activity, while the third was unable to attend due to a traumatic injury. The exclusion criterion for this group was non-attendance at the multi-adventure activity, even if the questionnaires had been completed.

- CG: the inclusion criterion for this second group was being an undergraduate student at the Faculty of Sport Sciences who was not enrolled in the Mountaineering course. Following the initial call for study participation, 29 volunteers expressed interest. Of these, six did not complete one of the measurement points. From the remaining 23, the first 20 participants to complete the surveys during the second measurement point were selected, ensuring homogeneity in the number of participants for each group.

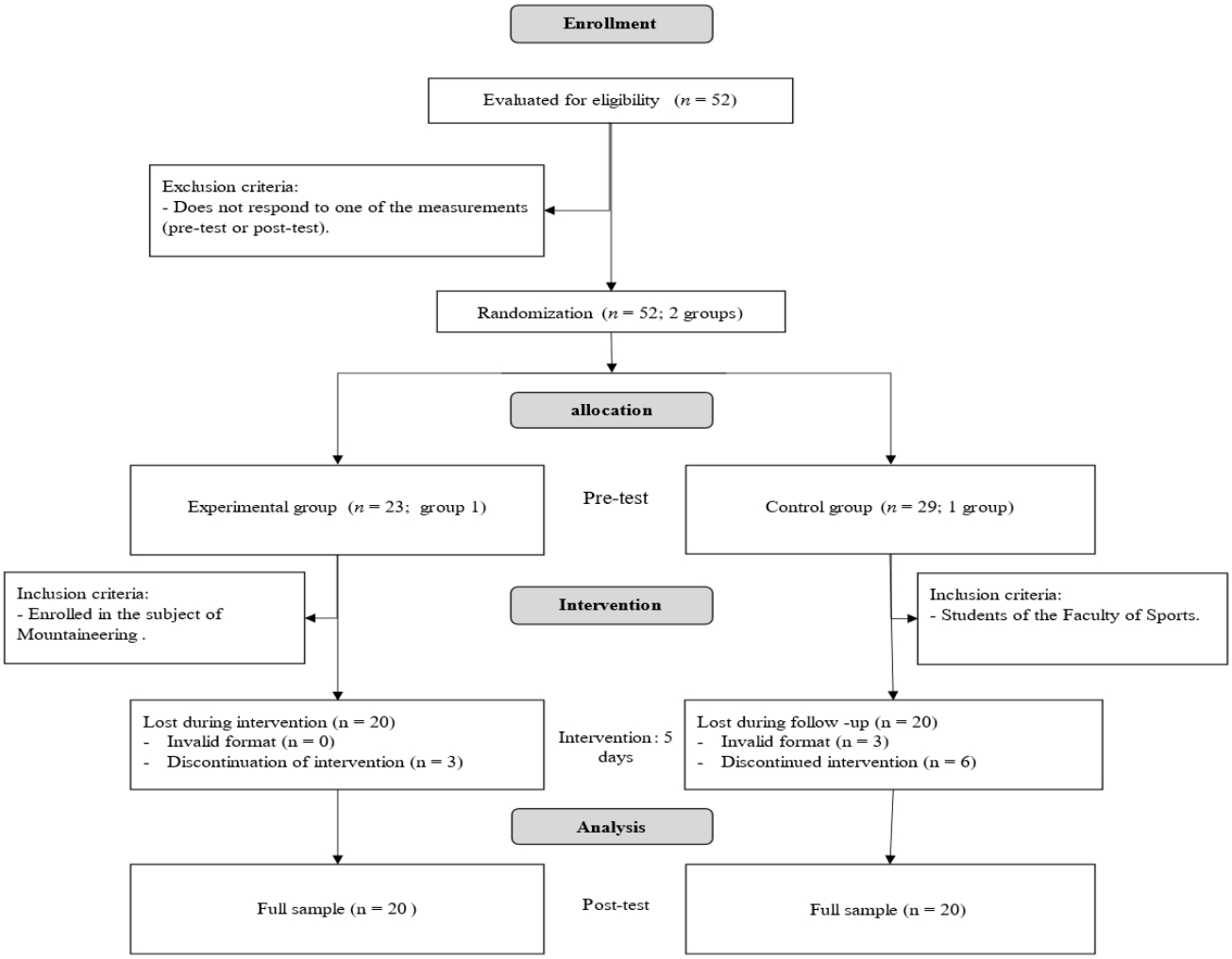

Figure 1: Flow chart of the progress of the quasi-experimental study, 2022

Instruments

To carry out this research, the following instruments have been used: To measure satisfaction with life (SWL), the Spanish version was validated by Atienza et al. (2000) from the original version by Diener et al. (1985). This instrument consists of 5 items that measure students' overall perception of their life satisfaction. The scale was preceded by the phrase, "Indicate your level of agreement or disagreement…". Responses were recorded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater life satisfaction. The final score was obtained by summing the five items, yielding a total score range of 5 to 25 points. Based on Diener et al. (1985), score interpretation follows these cut-off points: 5-9: Very dissatisfied, 10-14: Slightly dissatisfied, 15-19: Moderately satisfied, 20-25: Very satisfied. An example item is «If I could live my life over, I would change almost nothing».

The Spanish adaptation (Fernández-Berrocal et al., 2004) of the original Trait Meta-Mood Scale (TMMS; Salovey et al., 1995) was used to computer emotional intelligence. The scale measures the level of perceived emotional intelligence through 24 items, distributed across three subscales of 8 items each, which assess emotional attention, clarity of feelings, and emotional repair. The scale used preceded the introductory phrase: "Below you will find some statements about your emotions and feelings…". Responses were collected on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), and scores were obtained by summing the items within each subscale. Interpretation follows the cut-off points suggested by Fernández-Berrocal et al. (2004): Emotional attention: Low (< 24), Adequate (24-35), Excessive (>35); Emotional clarity: Inadequate (< 28), Adequate (≥ 28); Emotional repair: Inadequate (< 26), Adequate (≥ 26). The emotional attention subscale expresses the degree to which individuals notice and think about their feelings (e.g., "I pay a lot of attention to how I feel"). The clarity of feelings subscale assesses the ability

to understand one's own mood (e.g., "I am usually very clear about my feelings"). The emotional repair subscale evaluates the degree to which individuals moderate and regulate their feelings (e.g., "When I am sad, I try to think of pleasant things").

To measure anxiety, the Spanish adaptation of the State-Trait Anxiety Inventory, validated by Seisdedos (1982), was utilized from the original version of the *State-Trait Anxiety Inventory, STAI* (Spielberger et al., 1970). The STAI This self-report instrument comprises 40 items designed to assess two independent anxiety concepts: state anxiety (a transient emotional condition) and trait anxiety (a relatively stable anxiety predisposition). The temporal frame of reference for state anxiety is "right now, at this moment" (20 items), while for trait anxiety, it is "generally, on most occasions" (20 items). Each subscale consists of 20 items rated on a 4-point Likert scale (1 = almost never/not at all, 4 = very often/almost always). The final score for each subscale was obtained by summing the responses, ranging from 20 to 80 points. Higher scores indicate higher anxiety levels and the following cut-off points were established (Spielberger et al., 1970; Seisdedos, 1982): 20-39: Low anxiety, 40-59: Moderate anxiety, 60-80: High anxiety. An example item for the state anxiety subscale is "I feel upset," and for the trait anxiety subscale, "I miss out on things because I can't make up my mind quickly enough."

Procedure

Participants in both research groups (EG, CG) provided signed informed consent and a declaration of their rights as study participants based on the Declaration of Helsinki (World Medical Association, 2013). Additionally, approval was obtained from the corresponding institutional ethics committees; the University of Granada approved the study under number 621/CEIH. Upon acceptance of the study conditions and prior to the intervention program, a Google Form containing the selected measurement scales was created. Subsequently, a timeframe was established for participants to complete the pre-test in each research group. The EG group participated in the five-day intervention program two weeks after the pre-test. The post-test was then administered to all participants in both the EG and CG groups immediately following the conclusion of the EG group's intervention program, with a 24-hour window for completion.

Intervention Program

To conduct the research, a specific intervention program was developed based on the learning objectives for students enrolled in the Mountaineering course at the Faculty of Sport Sciences (see Table 1). The intervention program was designed and planned by the principal investigator and five instructors, all specialists in the field. Regarding implementation, the principal investigator did not participate, and the instructors were blinded to the research objectives to prevent potential bias. The intervention description, following the TIDieR guidelines (Hoffman et al., 2014), can be found in Table 2. The program was designed for five days due to two factors: 1) mobility restrictions imposed by the Spanish government due to the COVID-19 pandemic and 2) students' inability to miss extended periods of other courses, as the program was conducted during the academic semester. During the intervention program, participants were not informed of the specific activities they would be undertaking, although they were aware that the activities would take place in a natural environment. The intervention consisted of the following activities: Day 1) Canyoning; Day 2) setup and dismantling of vertical techniques, rappelling practice, module on pulleys and zip lines; Day 3) climbing module (ascending, climbing, and rappelling) and team building module (outdoor training, team building applied to vertical techniques and mountaineering); Day 4) via ferrata module, indoor survival technique module, and outdoor survival technique module with orientation; and Day 5) adventure racing module. Ultimately, the intervention program had two objectives: first, to facilitate the learning of content outlined in the Mountaineering course syllabus, and second, to analyze the study variables described previously.

Nº	Item	Content
1	*Short name*	PAS intervention program for adventure sports in university students in times of COVID-19.
2	*Why?*	Mindfulness activities are proposed as a training program that combines exercises to become aware of stimuli in the present moment, involving intention, attention, and attitude. Full attention to the present moment provides students with a more efficient response to what happens in the classroom.
3	*What? (materials)*	Research measurement instruments: – Test *SWL* to evaluate satisfaction with life. – Test *TMMS* to evaluate emotional intelligence. – Test *STAI* to measure anxiety. Materials used in the intervention program: – Related to adventure sports. • Rope hoist systems. • Semi-static and static ropes. • Descenders: Grigri, eight, ATC. • Safety helmets. • Neoprenes. • Harnesses. • Pulleys. • Drop dissipators. • Climbing blocker. • Anchor bags. • Climbing shoes. • Compasses. • Recreational physical education material will be used to work on content related to team building. • Material to work on contents related to survival, such as flint, water filters, cords, thermal blankets, and plastics.
4	*What? (procedures)*	Intervention program: – Pre-test: • Test SWL to evaluate life satisfaction. • Test TMMS to evaluate emotional intelligence. • Test STAI to measure anxiety. – 1st day of intervention: • Canyoning: the departure to Andévalo Aventuras began in Santa Bárbara de las Casas (Huelva). On the way, a stop was made, and canyoning was practiced at the Calzadilla Ravine in Almadén de la Plata. There, a group of instructors specializing in said activity was waiting. • Climbing Puebla de Guzmán • Via Ferrata el Morante in Calañas – 2nd day of intervention: • Vertical Techniques: In Santa Bárbara de las Casas, students received instruction on various setup, dismantling, and safety techniques through a module on rope hoist systems and zip lines. – 3rd day of intervention: • Módulo de escalada: En la Puebla de Guzmán (Huelva), se impartieron contenidos relacionados con la escalada y el rapel. Se enseñó a los estudiantes la técnica específica a tener en cuenta en la escalada, los descensores que se pueden utilizar en el rapel y los bloqueadores a usar en técnicas verticales. – 4th day of intervention: • Via Ferrata, Survival, and Orientation Module: a) In the morning, in Calañas, safety elements related to via ferratas were explained, followed by a practical session on the Morante via ferrata route. b) At midday, in Santa Bárbara de las Casas, survival skills were taught, including fire-starting using fire steel, water filtration techniques, and shelter construction. c) In the afternoon, in Santa Bárbara de las Casas, instruction was provided on orientation and compass use. – 5th day of intervention: • Adventure Racing Module: a) In Santa Bárbara de las Casas, students applied the knowledge and skills acquired throughout the program in a circuit set up around the El Andévalo hill. – Pos-test: final evaluation. • Test SWL to evaluate life satisfaction. • Test TMMS to evaluate emotional intelligence. • Test STAI to measure anxiety.
5	*Who? (provided)*	The pre-test and post-test were administered by the principal investigator, who has five years of experience in university teaching and research. The intervention program was implemented by five specialist instructors who were blinded to the research objectives. The intervention program was conducted primarily in the El Ándévalo hills in March 2021, adhering to the study's inclusion criteria.
6	*How?*	The specialist instructors conducted the selected activities each day based on logistical considerations. All members of the EG participated in all activities concurrently.

Nº	Item	Content
7	*Where?*	The intervention's headquarters were at Andévalo Aventuras, located in Santa Bárbara de las Casas. Activities were also carried out in Calañas, Puebla de Guzmán, and Almadén de la Plata.
8	*When and how much?*	Due to regional lockdown restrictions, participants were requested to complete the pre-test within a maximum of 48 hours via a Google Forms link. The pre-test was administered two weeks before the intervention program's implementation. The activities were carried out during the second week of March 2021.
9	*Adaptation Considerations*	Each activity was adapted to the students' skill level, as it involved highly specific challenges that required participants to overcome personal fears and limitations.
10	*Modifications*	No modifications to the intervention program were necessary as weather conditions remained favorable.
11	*How good (planned)*	The principal investigator oversaw the intervention. Five specialist instructors and the principal investigator, who also specializes in the field, conducted the intervention program. While the principal investigator participated in designing the intervention program, they did not assist in its implementation to minimize potential research bias. Upon completion of the intervention, each student completed the questionnaire containing the measurement scales again, with a 24-hour time limit for submission.
12	*How good? (Real)*	The program was developed as planned, and the effects were verified.

Table 2: Description of the intervention according to the TIDIER guide, 2022.

Statistical Analysis

To resolve this study's objective, the groups' homogeneity was preliminarily analyzed, and the Student's *t*-test was performed for independent samples with the data collected in the first measurement (EG vs. CG). Subsequently, Box's *M* test was conducted to assess the homogeneity of variance-covariance matrices. An independent samples *t*-test was employed on post-test data to compare differences between the EG and CG following the intervention program. Effect sizes (Cohen's *d*) were calculated, considering the intervals reported by Cohen (1988): 0.1 to 0.3, small effect; 0.3 to 0.5, medium effect; 0.5 to higher scores, large effect. All analyses were performed using SPSS Statistics 27.0.

RESULTS

Preliminary Analysis

To analyze potential differences in life satisfaction, emotional intelligence, and anxiety levels between the two groups (EG and CG), a comparison of means was conducted using pre-test data (see Table 3). Box's *M* test was applied to assess the homogeneity of variance-covariance matrices. Results indicated homogeneity for all variables: life satisfaction ($F = .244$, $df = 1$, $p = .621$); emotional attention ($F = .016$, $df = 1$, $p = .899$); emotional clarity ($F = 1.338$, $df = 1$, $p = .247$); emotional repair ($F = .052$, $df = 1$, $p = .820$); EA ($F = .679$, $df = 1$, $p = .410$); and RA ($F = .722$, $df = 1$, $p = .396$). It is important to note that violations of this assumption have minimal impact when group sizes are approximately equal (Hair et al., 1999).

	EG		CG		*p*	*t*	*df*	*d*	95% Confidence Interval (*CI*)	
	M	*SD*	*M*	*SD*					Lower	Upper
SWL	4.16	.55	3.86	.49	.074	1.837	38	.581	-.056	1.211
EA	3.55	.68	3.43	.70	.568	.575	38	.182	-.440	.802
CE	3.89	.54	3.67	.71	.281	1.094	38	.346	-.281	.968
RE	3.97	.68	3.65	.64	.133	1.533	38	.485	-.147	1.111
SA	36.75	9.01	36.55	10.92	.950	0.63	38	.020	-.600	.640
RA	42.35	7.73	44.70	9.42	.394	-.863	38	-.273	-.894	.352

*Note: SWL = Satisfaction with live; EA = Emotional attention; EC = Emotional clarity; RE = Emotional repair; SA = State anxiety; TA = Trait anxiety; d = Effect size; *(p < .05), **(p < .01)*

Table 3: Independent Samples *t*-test. Pre-test. 2022.

Post-test Analysis for Independent Samples

As shown in Table 4, the means and standard deviations for the study variables are presented for both the EG and CG at the post-test. Compared to the CG, the EG demonstrated statistically significant improvements in life satisfaction and emotional attention and a decrease in state anxiety levels. No statistically significant differences were found between groups for trait anxiety, emotional clarity, or emotional repair.

	EG		CG		p	t	df	d	95% Confidence Interval (CI)	
	M	SD	M	SD					Lower	Upper
SWL	4.27	.43	3.95	.45	.027*	2.297	38	.727	.081	1.363
EA	3.85	.64	3.44	.62	.045*	2.070	38	.654	.013	1.262
CE	4.02	.52	3.75	.76	.199	1.308	38	.414	-.216	1.038
RE	3.97	.66	3.70	.68	.213	1.268	38	.401	-.228	1.025
SA	29.30	7.53	36.40	8.78	.009**	-2.746	38	-.868	-1.513	-.213
RA	41.15	8.17	43.95	9.34	.319	-1.009	38	-.319	-.941	.307

*Note: SWL= Satisfaction with live; EA = Emotional attention; EC = Emotional clarity; RE = Emotional repair; SA = State anxiety; TA = Trait anxiety; d = Effect size; *(p < .05), **(p < .01)*

Table 4: Independent samples *t*-test. Post test. 2022.

Analysis for Related Simples

Table 5 presents the means and standard deviations for the study variables, comparing the effects of the intervention program for both the EG and CG. The EG showed statistically significant improvement in SA and non-significant improvement in EC. Conversely, SA significantly decreased. However, no significant changes were observed in the CG.

Experimental Group										
	Pre		Post		p	t	df	d	95% Confidence Interval (CI)	
	M	SD	M	SD					Lower	Upper
SWL	4.16	.55	4.27	.43	.237	-1.222	19	-.273	-.717	.177
EA	3.55	.68	3.85	.64	.004*	-3.222	19	-.721	-.702	.173
CE	3.89	.54	4.02	.52	.065	-1.961	19	-.438	-.893	.026
RE	3.97	.68	3.97	.66	.928	.092	19	.021	-.418	.459
SA	36.75	9.01	29.3	7.53	.000**	4.160	19	.930	.394	1.449
RA	42.35	7.73	41.15	8.17	.420	-1.961	19	.184	-.260	.624
Control Group										
	Pre		Post		p	t	df	d	95% Confidence Interval (CI)	
	M	SD	M	SD					Lower	Upper
SWL	3.86	.49	3.95	.45	.186	-1.371	19	-.307	-.752	.146
EA	3.43	.70	3.44	.62	.920	-.102	19	-.023	-.461	.416
CE	3.67	.71	3.75	.76	.412	-.838	19	-.187	-.627	.257
RE	3.65	.64	3.70	.68	.651	-.459	19	-.103	-.541	.338
SA	36.55	10.92	36.40	8.78	.886	.145	19	.032	-.406	.470
RA	44.70	9.42	43.95	9.34	.468	.741	19	.166	-.278	.605

*Note: SWL = Satisfaction with live; EA = Emotional attention; EC = Emotional clarity; RE = Emotional repair; SA = State anxiety; TA = Trait anxiety; d = Effect size; *(p < .05), **(p < .01)*

Table 5: Paired samples *t*-test, 2022

DISCUSSION

Numerous studies have highlighted the importance of PAS in natural environments for improving various psychological variables in a pre-COVID-19 pandemic context (Alkahtani et al., 2019; Byrka & Ryczko, 2018; Calogiuri et al., 2015; Calogiuri et al., 2016; Olafsdottir et al., 2018; Turner & Stevinson, 2017). However, to our knowledge, no studies have been conducted during the pandemic and the period of perimeter lockdown. This study aimed to analyze the effects of a physical activity program in nature on life satisfaction, emotional intelligence, and anxiety.

Focusing on the analysis of mean comparisons for independent samples, this study found a statistically significant difference in life satisfaction, being higher in the experimental group compared to the control group at the post-test. These results are consistent with previous findings from studies conducted before the pandemic (Olafsdottir et al., 2018; Turner & Stevinson, 2017). Similarly, secondary school students who receive this type of content have been shown to report higher levels of satisfaction with physical education classes (Baena-Extremera & Granero-Gallegos, 2015). This could be explained by the fact that physical activities undertaken in natural environments tend to generate feelings of revitalization (Daviu-Fuster, 2020) and have a greater potential for restoring negative emotions, in addition to fostering a positive connection with the natural environment (Calogiuri et al., 2016). Consistent with this, Calogiuri et al. (2015) found that when dance classes are held outdoors, participants report increased positive emotions and psychological well-being compared to classes held indoors.

Regarding the dimensions of emotional intelligence, the results

showed a statistically significant improvement in EA in emotion management compared to the CG. The emotional clarity dimension also increased, although not significantly. It is worth noting that these results were observed in both the independent samples t-test and the paired samples t-test. Several studies have found that engaging in PAS in natural environments enhances emotional intelligence (De la Torre, 2018; Villegas et al., 2016), However, these studies are limited in number and analyze emotional intelligence unidimensionally. Other research exploring the impact of PAS on emotional intelligence has found that students with higher levels of PAS score better across all three dimensions of emotional intelligence, particularly in emotional attention and repair (Acebes-Sánchez et al., 2019; Ubago-Jiménez et al., 2021). This could be because PAS is a mechanism that develops different emotions (Acebes-Sánchez et al., 2019), such as facing challenges, collaborating as part of a team, or competing with oneself (Ubago-Jiménez et al., 2019). Thus, physical activity generates different contexts that help to self-regulate and modulate mood changes (Kerr & Kuk, 2001). This emotional regulation could be further enhanced in individuals who are surrounded by natural environments, away from urban settings (Bratman et al., 2019; Gritzka et al., 2020; Roberts et al., 2019). This predisposition to better understand our feelings and what they mean when we engage in PAS in nature may be due to the fact that in this environment, we have more time to reflect and think about ourselves without the disturbance of other people, sounds, etc., that would interrupt us in an urban environment and diminish this level of emotional attention (Villegas et al., 2016).

Regarding the anxiety variable, a greater significant difference was found in SA in the EG (being lower in the post-test) compared to the CG, with no significant differences found in TA. It is worth noting that these results were observed in both the independent samples t-test and the paired samples t-test. Although we are not aware of any studies that have analyzed the impact of PAS intervention programs in nature on state and trait anxiety, the scientific literature has shown that such programs improve positive affect (Olafsdottir et al., 2018), the tranquility (Byrka & Ryczko, 2018) and reducing stress (Alkahtani et al., 2019). Furthermore, various investigations have linked the practice of PAS with a decrease in SA (Frontini et al., 2021; Meira et al., 2020; Reigal et al., 2021) and TA (Frontini et al., 2021). A possible explanation for the results obtained is that the practice of PAS is associated with lower sympathetic nervous system and hypothalamic-pituitary-adrenal axis reactivity (Rimmele et al., 2007). Dysregulations in the hypothalamic-pituitary-adrenal axis have been implicated in the manifestation of depressive and anxiety symptoms. Therefore, and considering the results obtained in the present investigation, engaging in PAS in general and specifically in natural environments may help reduce anxiety.

Finally, this research has several strengths worth mentioning. These include conducting a five-day intensive PAS intervention program in a natural environment during a period of full perimeter lockdown, blinding the instructors of the intervention program, and having a considerable sample size for a quasi-experimental study. However, we must also point out several limitations. Firstly, the sample was not randomized. It was not possible to randomize the sample because the EG had to be students enrolled in the Mountaineering course of the Degree in Physical Activity and Sports Sciences. However, we do not believe that this affected the results of the research since the pre-test data were collected two weeks before the start of the intervention program, with blinding of the participants. In addition, the entire sample selected were students from the Faculty of Sports, and the participation of students from other faculties was not considered. We consider that another limitation of the study was the time of year in which the intervention program was carried out. The state government had recently relaxed restrictive measures on the population, which may have slightly altered the scores of the control group, although the perimeter lockdown was maintained. Another limitation could be the duration of the intervention program. Although a 24-hour intervention program was designed for five days to create a "bubble group," we believe that a longer program would have obtained greater positive effects on the variables analyzed. Due to these limitations, we believe that future research should consider students from different university degrees in which the sample is randomized to participate in the experimental group. We also consider it interesting to analyze academic variables after carrying out physical activity protocols in the natural environment.

CONCLUSION

Despite the limitations mentioned above, this article presents the first quasi-experimental study that compared the effects of a PAS intervention program in a natural environment during the period of perimeter lockdown caused by the COVID-19 pandemic. In summary, the preliminary analysis showed homogeneity of the sample with respect to all the variables studied. After conducting the post-test analysis, we can conclude that the EG showed a significant difference compared to the CG in SWL, EA, and SA. SWL and EA improved in the EG after the implementation of the PAS program in the natural environment, while SA decreased considerably. EC also increased, although not significantly compared to the CG. ER and TA remained practically at the same levels in both groups.

Despite the limitations mentioned above, this article presents the first quasi-experimental study that compared the effects of a physical activity intervention program in a natural environment during the period of perimeter lockdown caused by the COVID-19 pandemic. In summary, the preliminary analysis showed homogeneity of the sample with respect to all the variables studied. After conducting the post-test analysis, we can conclude that the EG showed a significant difference compared to the CG in SWL, EA, and SA. SWL and EA improved in the EG after the implementation of the PAS program in the natural environment, while SA decreased considerably. EC also increased, although not significantly compared to the CG. ER and TA remained practically at the same levels in both groups.

Practical Implications

The results of this research highlight the psychological benefits obtained by university students who have been subjected

to a stressful situation such as that experienced during the COVID-19 pandemic. Therefore, we believe it is advisable for educational institutions to design and offer PAS programs in various natural environments (e.g., hiking, meditation, yoga, climbing, via ferratas, outdoor dance classes, among others), as they positively affect different psychological variables (Alkahtani et al., 2019; Ballester-Martínez et al., 2022; Byrka & Ryczko, 2018; Calogiuri et al., 2016; Turner & Stevinson, 2017). These activities should not only be offered to increase psychological well-being in the aftermath of the pandemic but also during the academic year. This will allow students to acquire coping skills for stressful situations experienced both during the academic term and in the period leading up to exams (Olafsdottir et al., 2018).

REFERENCES

Acebes-Sánchez, J., Diez-Vega, I., Esteban-Gonzalo, S. and Rodriguez-Romo, G. (2019) 'Physical activity and emotional intelligence among undergraduate students: A correlational study', *BMC public health*, Vol. 19, No. 1, pp. 1–7. https://doi.org/10.1186/s12889-019-7576-5

Alemany-Arrebola, I., Rojas-Ruiz, G., Granda-Vera, J. and Mingorance-Estrada, Á. C. (2020) 'Influence of COVID-19 on the perception of academic self-efficacy, state anxiety, and trait anxiety in college students', *Frontiers in Psychology*, Vol. 11, p. 570017. https://doi.org/10.3389/fpsyg.2020.570017

Alkahtani, S., Assel, E., Kannas, J. and Shamlan, G. (2019) 'Effect of acute high-intensity interval cycling while viewing a virtual natural scene on mood and eating behavior in men: A randomized pilot trial', *Clinical Nutrition Experimental*, 28, pp. 92–101. https://doi.org/10.1016/j.yclnex.2019.10.003

Amekran, Y. and El Hangouche, A. J. (2022) 'Physical activity patterns of university students during the COVID-19 pandemic: The impact of state anxiety', *Journal of Education and Health Promotion*, Vol 11, No. 1, p. 129. https://doi.org/10.4103/jehp.jehp_1118_21

Atienza, F. L., Pons, D., Balaguer, I. and García-Merita, M. (2000) 'Propiedades psicométricas de la Escala de Satisfacción con la Vida en adolescentes', *Psicothema*, Vol. 12, No. 2, pp. 314–319.

Baena-Extremera, A. and Gallegos, A. G. (2015) 'Efectos de las actividades en la naturaleza en la predicción de la satisfacción de la Educación Física', *Retos. Nuevas tendencias en Educación Física, Deporte y Recreación*, Vol. 28, pp. 9–14. https://doi.org/10.47197/retos.v0i28.34816

Ballester-Martínez, O., Baños, R. and Navarro-Mateu, F. (2022) 'Actividad física, naturaleza y bienestar mental: una revisión sistemática', *Cuadernos de Psicología del Deporte*, Vol. 22, No. 2, pp. 62–84. https://doi.org/10.6018/cpd.465781

Bartos, L. J., Funes, M. J., Ouellet, M., Posadas, M. P. and Krägeloh, C. (2021) 'Developing resilience during the COVID-19 pandemic: Yoga and mindfulness for the well-being of student musicians in Spain', *Frontiers in Psychology*, Vol. 12, p. 642992. https://doi.org/10.3389/fpsyg.2021.642992

Bratman, G. N., Anderson, C. B., Berman, M. G., Cochran, B., De Vries, S., Flanders, J., ... and Daily, G. C. (2019) 'Nature and mental health: An ecosystem service perspective', *Science Advances*, Vol. 5, No. 7, p. eaax0903. https://doi.org/10.1126/sciadv.aax0903

Byrka, N. and Ryczko, N. (2018) 'Positive effects of dancing in natural versus indoor settings: The mediating role of engagement in physical activity', *Journal of Environmental Psychology*, Vol. 57, pp. 25–33. https://doi.org/10.1016/j.jenvp.2018.06.002

Calogiuri, G., Evensen, K., Weydahl, A., Andersson, K., Patil, G., Ihlebak, C. and Raanaas, R. (2016) 'Green exercise as a workplace intervention to reduce job stress: Results from a pilot study', *Work*, 53, pp. 99-111. https://doi.org/10.3233/WOR-152219

Calogiuri, G., Nordtug, H. and Weydahl, A. (2015) 'The potential of using exercise in nature as an intervention to enhance exercise behavior: Results from a pilot study', *Perceptual & Motor Skills: Exercise & Sport*, 121, pp. 1-21. https://doi.org/10.2466/06.PMS.121c17x0

Cassà, E. L., Pérez-Escoda, N. and Alegre, A. (2018) 'Competencia emocional, satisfacción en contextos específicos y satisfacción con la vida en la adolescencia', *Revista de Investigación Educativa*, Vol. 36, No. 1, pp. 57–73. https://doi.org/10.6018/rie.36.1.273131

Cedeño, N. J. V., Cuenca, M. F. V., Mojica, Á. A. D. and Portillo, M. T. (2020) 'Afrontamiento del COVID-19: estrés, miedo, ansiedad y depresión', *Enfermería Investiga*, Vol. 5, No. 3, pp. 63–70. https://doi.org/10.31243/ei.uta.v5i3.913.2020

Cohen, J. (1992) 'Statistical Power Analysis', *Current Directions in Psychological Science*, 1(3), pp. 98–101. https://doi.org/10.1111/1467-8721.ep10768783

Daviu-Fuster, I. (2020) *Intervención deportiva a través de actividades físicas en el medio natural en un programa de control de la ansiedad. [Trabajo Fin de Grado, Universidade da Coruña].*

De La Torre Elías, C. G. (2018) *La Inteligencia emocional como medio para la sensibilización sobre la importancia del cuidado y preservación del mundo natural. [Trabajo Fin de Grado, Benemérita y Centenaria Escuela Normal del Estado de San Luis Potosí].*

Diener, E. and Emmons, R. A. (1985) 'The independence of positive and negative affect', *Journal of Personality Assessment,* Vol. 47, No. 5, pp. 1105–1117. https://doi.org/10.1037/0022-3514.47.5.1105

Diener, E., Emmons, R., Larsen, R. J. and Griffin, S. (1985) 'The Satisfaction With Life Scale', *Journal of Personality Assessment*, Vol. 49, No. 1, pp. 71–75. https://doi.org/10.1207/s15327752jpa4901_13

Faulkner, G., Rhodes, R. E., Vanderloo, L. M., Chulak-Bozer, T., O'Reilly, N., Ferguson, L. and Spence, J. C. (2020) 'Physical activity as a coping strategy for mental health due to the COVID-19 virus: a potential disconnect among Canadian adults?', *Frontiers in Communication*, Vol. 5, p. 571833. https://doi.org/10.3389/fcomm.2020.571833

Fernandez-Berrocal, P., Extremera, N. and Ramos, N. (2004) 'Validity and reliability of the spanish modified version of the trait meta-mood scale 1, 2', *Psychological Reports,* Vol. 94, No. 3, pp. 751–755. https://doi.org/10.2466/pr0.94.3.751-755

Fernández-Castillo, A. (2021) 'State-anxiety and academic burnout regarding university access selective examinations in Spain during and after the COVID-19 lockdown', *Frontiers in Psychology*, Vol. 12, p. 621863. https://doi.org/10.3389/fpsyg.2021.621863

Finnerty, R., Marshall, S. A., Imbault, C. and Trainor, L. J. (2021) 'Extra-curricular activities and well-being: Results from a survey of undergraduate university students during COVID-19 lockdown restrictions', *Frontiers in Psychology*, Vol. 12, p. 2316. https://doi.org/10.3389/fpsyg.2021.647402

Frontini, R., Rebelo-Gonçalves, R., Amaro, N., Salvador, R., Matos, R., Morouço, P. and Antunes, R. (2021) 'The relationship between anxiety levels, sleep, and physical activity during COVID-19 lockdown: An exploratory study', *Frontiers in Psychology*, Vol. 12, p. 786. https://doi.org/10.3389/fpsyg.2021.659599

García-Álvarez, D., Hernández-Lalinde, J. and Cobo-Rendón, R. (2021) 'Emotional Intelligence and Academic Self-Efficacy in Relation to the Psychological Well-Being of University Students During COVID-19 in Venezuela', *Frontiers in Psychology*, Vol. 12. https://doi.org/10.3389/fpsyg.2021.759701

Goleman, D. (2008) *La inteligencia emocional. España: Kairós.*

Gritzka, S., MacIntyre, T. E., Dörfel, D., Baker-Blanc, J. L. and Calogiuri, G. (2020) 'The effects of workplace nature-based interventions on the mental health and well-being of employees: a systematic revie', *Frontiers in Psychiatry*, Vol. 11. https://doi.org/10.3389/fpsyt.2020.00323

Ha, Y., Lee, S. H., Lee, D. H., Kang, Y. H., Choi, W. and An, J. (2022) 'Effectiveness of a Mobile Wellness Program for Nurses with Rotating Shifts during COVID-19 Pandemic: A Pilot Cluster-Randomized Trial', *International Journal of Environmental Research and Public Health*, Vol. 19, No. 2, p. 1014. https://doi.org/10.3390/ijerph19021014

Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2018). *Multivariate data analysis (8th ed.)*. Cengage Learning EMEA.

Herrera Gutiérrez, E., Brocal Pérez, D., Sánchez Marmol, D. J. and Rodríguez Dorantes, J. M. (2013) 'Relación entre actividad física, depresión y ansiedad en adolescentes', *Cuadernos de Psicología del Deporte*, Vol. 12, No. 2, pp. 31–38.

Hoffmann, T. C., Glasziou, P. P., Boutron, I., Milne, R., Perera, R., Moher, D., ... and Michie, S. (2014) 'Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide', *Bmj*, Vol. 348, No. mar07 3, p. g1687. https://doi.org/10.1136/bmj.g1687

Kerr, J. H. and Kuk, G. (2001) 'The effects of low and high intensity exercise on emotions, stress and effort', *Psychology of Sport and Exercise*, Vol. 2, No. 3, pp. 173–186. https://doi.org/10.1016/S1469-0292(00)00021-2

Kökçam, B., Arslan, C. and Traş, Z. (2022) 'Do Psychological Resilience and Emotional Intelligence Vary Among Stress Profiles in University Students? A Latent Profile Analysis', *Frontiers in Psychology*, Vol. 12, p. 788506. https://doi.org/10.3389/fpsyg.2021.788506

Krause, A. E., Dimmock, J., Rebar, A. L. and Jackson, B. (2021) 'Music listening predicted improved life satisfaction in university students during early stages of the COVID-19 pandemic', *Frontiers in Psychology*, Vol. 11, p. 631033. https://doi.org/10.3389/fpsyg.2020.631033

Legrand, F. D., Race, M. and Herring, M. P. (2018) 'Acute effects of outdoor and indoor exercise on feelings of energy and fatigue in people with depressive symptoms', *Journal of Environmental Psychology*, Vol. 56, pp. 91–96. https://doi.org/10.1016/j.jenvp.2018.03.005

Liu, S., Yang, L., Zhang, C., Xiang, Y. T., Liu, Z., Hu, S. and Zhang, B. (2020) 'Online mental health services in China during the COVID-19 outbreak', *The Lancet Psychiatry,* Vol. 7, No. 4, pp. e17–e18. https://doi.org/10.1016/S2215-0366(20)30077-8

McMahon, E. M., Corcoran, P., O'Regan, G., Keeley, H., Cannon, M., Carli, V., ... and Wasserman, D. (2017) 'Physical activity in European adolescents and associations with anxiety, depression and well-being', *European child & adolescent psychiatry,* Vol. 26, No. 1, pp. 111–122. https://doi.org/10.1007/s00787-016-0875-9

Meira Jr, C. M., Meneguelli, K. S., Leopoldo, M. P. and Florindo, A. A. (2020) 'Anxiety and leisure-domain physical activity frequency, duration, and intensity during covid-19 pandemic', *Frontiers in Psychology*, Vol. 11, p. 603770. https://doi.org/10.3389/fpsyg.2020.603770

Moreno-Proaño, G. (2020) 'Pensamientos distorsionados y ansiedad generalizada en COVID-19', *CienciAmérica*, Vol. 9, No. 2, pp. 251–255. https://doi.org/10.33210/ca.v9i2.314

Nicolini, H. (2020) 'Depresión y ansiedad en los tiempos de la pandemia de COVID-19', *Cirugía y Cirujanos*, Vol. 88, No. 5, pp. 542–547. https://doi.org/10.24875/CIRU.M20000067

Nikolis, L., Wakim, A., Adams, W. and DO, P. B. (2021) 'Medical student wellness in the United States during the COVID-19 pandemic: a nationwide survey', *BMC medical education*, Vol. 21, No. 1, pp. 1–9. https://doi.org/10.1186/s12909-021-02837-y

Olafsdottir, G., Cloke, P., Schulz, A., van Dyck, Z., Eysteinsson, T., Thorleifsdottir, B. and Vogele, C. (2018) 'Health Benefits of Walking in Nature: A Randomized Controlled Study Under Conditions of Real-Life Stress', *Environment and Behavior*, Vol. 52, No. 3, pp. 248–274. https://doi.org/10.1177/0013916518800798

Ozcorta, E. J. F., Torres, B. J. A. and Buñuel, P. S. L. (2015) 'Inteligencia emocional percibida y el bienestar psicológico de estudiantes universitarios en función del nivel de actividad física', *Cultura, ciencia y deporte,* Vol. 10, No. 28, pp. 31–39. https://doi.org/10.12800/ccd.v10i28.513

Persich, M. R., Smith, R., Cloonan, S. A., Woods-Lubbert, R., Strong, M. and Killgore, W. D. (2021) 'Emotional intelligence training as a protective factor for mental health during the COVID-19 pandemic', *Depression and anxiety*, Vol. 38, No. 10, pp. 1018–1025. https://doi.org/10.1002/da.23202

Prieto-Molinari, D. E., Bravo, G. L. A., de Pierola, I., Victoria-de Bona, G. L., Merea Silva, L. A., Lazarte Nuñez, C. S., ... and Zegarra, Á. C. (2020) 'Depresión y ansiedad durante el aislamiento obligatorio por el COVID-19 en Lima Metropolitana', *Liberabit*, Vol. 26, No. 2, p. e425. https://doi.org/10.24265/liberabit.2020.v26n2.09

Reigal, R. E., Páez-Maldonado, J. A., Pastrana-Brincones, J. L., Morillo-Baro, J. P., Hernández-Mendo, A. and Morales-Sánchez, V. (2021) 'Physical activity is related to mood states, anxiety state and self-rated health in COVID-19 lockdown', *Sustainability*, Vol. 13, No. 10, p. 5444. https://doi.org/10.3390/su13105444

Rettew, D. C., McGinnis, E. W., Copeland, W., Nardone, H. Y., Bai, Y., Rettew, J., ... and Hudziak, J. J. (2021) 'Personality trait predictors of adjustment during the COVID pandemic among college students', *PLoS One*, Vol. 16, No. 3, p. e0248895. https://doi.org/10.1371/journal.pone.0248895

Rimmele, U., Zellweger, B. C., Marti, B., Seiler, R., Mohiyeddini, C., Ehlert, U. and Heinrichs, M. (2007) 'Trained men show lower cortisol, heart rate and psychological responses to psychosocial stress compared with untrained men', *Psycho neuro endocrinology*, Vol. 32, No. 6, pp. 627–635. https://doi.org/10.1016/j.psyneuen.2007.04.005

Roberts, H., van Lissa, C., Hagedoorn, P., Kellar, I. and Helbich, M. (2019) 'The effect of short-term exposure to the natural environment on depressive mood: A systematic review and meta-analysis', *Environmental Research*, Vol. 177, p. 108606. https://doi.org/10.1016/j.envres.2019.108606

Salovey, P. and Mayer, J. (1997) 'What is emotional intelligence? Emotional development and emotional intelligence: Implications for educators', in *Sharing knowledge. Executive excellence*, New York: Basic Books. Senge, PM

Salovey, P., Mayer, J. D., Goldman, S. L., Turvey, C. and Palfai, T. P. (1995) 'Emotional attention, clarity, and repair: Exploring emotional intelligence using the Trait Meta-Mood Scale', in J. W. Pennebaker (ed.), *Emotion, disclosure, & health*, Washington DC: American Psychological Association.

Seisdedos, N. (1982) *STAI: Cuestionario de Ansiedad Estado-Rasgo,* Madrid: TEA.

Sfeir, M., Akel, M., Hallit, S. and Obeid, S. (2022) 'Factors associated with general well-being among Lebanese adults: the role of emotional intelligence, fear of COVID, healthy lifestyle, coping strategies (avoidance and approach)', *Current Psychology*, Vol. 42, No. 20, pp. 17465–17474. https://doi.org/10.1007/s12144-021-02549-y

Spielberger, C. D. (1966) 'The effects of anxiety on complex learning and academic achievement', in C.D. Spielberger (ed.). *Anxiety and Behavior*. New York: Academic Press INC.

Spielberger, C. D., Gorsuch, R. C. and Lushene; R. F. (1970) *Manual for the Scare-Trair Anxiety Inventory*, Palo Alto, CA: Consulting Psychologist Press.

Turner, T. L. and Stevinson, C. (2017) 'Affective outcomes during and after high-intensity exercise in outdoor green and indoor gym settings', *International Journal Of Environmental Health Research*, Vol. 27, No. 2, pp. 106–116. https://doi.org/10.1080/09603123.2017.1282605

Ubago-Jiménez, J. L., Cepero-González, M., Martínez-Martínez, A. and Chacón-Borrego, F. (2021) 'Linking Emotional Intelligence, Physical Activity and Aggression among Undergraduates', *International Journal of Environmental Research and Public Health*, Vol. 18, č. 23, p. 12477. https://doi.org/10.3390/ijerph182312477

Ubago-Jiménez, J. L., González-Valero, G., Puertas-Molero, P. and García-Martínez, I. (2019) 'Development of emotional intelligence through physical activity and sport practice. A systematic review', *Behavioral Sciences*, Vol. 9, No. 4, p. 44. https://doi.org/10.3390/bs9040044

Vaquero-Solís, M., Alonso, D. A., Sánchez-Oliva, D., Sánchez-Miguel, P. A. and Iglesias-Gallego, D. (2020) 'Inteligencia emocional en la adolescencia: motivación y actividad física', *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte*, Vol. 20, No. 77, pp. 119–131. https://doi.org/10.15366/rimcafd2020.77.008

Villegas, C., Cortés, G., Díaz, M. C., Flores, C. and Rojas, P. (2016) *Relación entre Inteligencia Emocional y Conectividad con la Naturaleza, Eureka (Asunción, En línea),* [Online], Available: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-905720

World Medical Association. (2013) 'World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects', *Jama*, Vol. 310, No. 20, pp. 2191–2194. https://doi.org/10.1001/jama.2013.281053