Emotional life skills and active lifestyle in university students: a 12-week multicomponent quasi-experimental protocol

Habilidades emocionales para la vida y estilo de vida activo en estudiantes universitarios: protocolo cuasi-experimental multicomponente de 12 semanas

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Abstract

Introduction: University students face increasing psychological, academic, and lifestyle-related demands, underscoring the need for structured interventions addressing emotional competencies and health-related behaviors in higher education. Previous programs have often targeted isolated components and lacked sufficient methodological detail for replication.
Objective: To describe the design and methodological development of a 12-week multicomponent intervention protocol targeting emotional life skills and lifestyle-related behaviors in university students.
Methods: This protocol outlines a quasi-experimental, longitudinal pre–post study with a non-randomized experimental group and a passive control group. Approximately 100 undergraduate students enrolled in health- and movement-related programs will be recruited through convenience sampling. The intervention combines weekly psychological life-skills sessions, monthly psycho-nutritional workshops, and weekly structured physical exercise sessions. Emotional life skills will be assessed using validated measures of emotional regulation and emotional metacognition, while lifestyle-related behaviors will be evaluated through dietary adherence and physical activity habits. Functional physical performance will be measured using standardized strength, power, and sprint tests. Group allocation, assessment procedures, intervention fidelity, and follow-up conditions are predefined to ensure transparency and replicability. Data will be analyzed using repeated-measures general linear models to examine time × group effects.
Conclusions: This protocol provides a detailed and replicable framework for evaluating a multicomponent intervention aimed at improving emotional and lifestyle-related competencies in university students, serving as a basis for future empirical evaluation rather than evidence of effectiveness.

Keywords

Emotional intelligence; exercise; lifestyle; students; university.

Resumen

Introducción: Los estudiantes universitarios afrontan crecientes demandas psicológicas, académicas y relacionadas con el estilo de vida, lo que evidencia la necesidad de intervenciones estructuradas que aborden competencias emocionales y conductas de salud en educación superior. Los programas previos suelen centrarse en componentes aislados y presentan limitaciones metodológicas para su replicación.
Objetivo: Describir el diseño y desarrollo metodológico de un protocolo de intervención multicomponente de 12 semanas orientado a mejorar las habilidades emocionales para la vida y los comportamientos relacionados con el estilo de vida en estudiantes universitarios.
Método: Se presenta un estudio cuasi-experimental, longitudinal, con medidas pre–post, que incluye un grupo experimental no aleatorizado y un grupo control pasivo. Participarán aproximadamente 100 estudiantes de grado de titulaciones relacionadas con la salud y el movimiento, reclutados mediante muestreo por conveniencia. La intervención integra sesiones semanales de habilidades psicológicas, talleres psiconutricionales mensuales y ejercicio físico estructurado semanal. Las habilidades emocionales se evaluarán mediante medidas validadas de regulación y metacognición emocional, mientras que los comportamientos de estilo de vida se analizarán a través de la adherencia dietética y la actividad física. El rendimiento físico se medirá mediante pruebas estandarizadas de fuerza, potencia y velocidad. Se han predefinido los procedimientos para garantizar transparencia y replicabilidad. El análisis se realizará mediante modelos lineales generales de medidas repetidas.
Conclusiones: Este protocolo ofrece un marco metodológico detallado y replicable para evaluar intervenciones multicomponente, constituyendo una base para futuras evaluaciones empíricas, más que evidencia de efectividad.

Palabras clave

Ejercicio físico; estilo de vida; estudiantes; inteligencia emocional.

Introduction

Mental health difficulties among university students represent a growing public health concern, characterized by increasing levels of emotional distress, psychological maladjustment, and unhealthy lifestyle behaviors (Auerbach et al., 2018). This population faces specific academic, social, and transitional stressors that differentiate it from adolescent or school-aged groups, including academic pressure, autonomy demands, future professional uncertainty, and the consolidation of long-term health-related habits. Consequently, higher education has been identified as a strategic context for preventive and promotive health interventions targeting emotional, behavioral, and physical well-being.

From a contemporary health perspective, optimal health is no longer understood as the absence of disease but rather as the dynamic integration of psychological, social, and physical functioning within a biopsychosocial framework (World Health Organization [WHO], 2010). In university populations, this integrative view is particularly relevant, as emotional self-regulatory capacities, lifestyle behaviors, and physical fitness mutually interact and condition students' adjustment, performance, and long-term health trajectories.

Intrapersonal and interpersonal emotional regulation competencies as core life skills in university students

Among the psychological factors implicated in students' well-being, emotional regulation has been identified as key life skills for adaptive functioning in academic and social contexts. Emotional regulation refers to individuals' capacity to monitor, understand, and modulate emotional responses in accordance with situational demands (Gross & John, 2003). Deficits in these abilities have been associated with increased emotional distress, maladaptive coping strategies, and poorer mental health outcomes in young adults (Chen & Bonanno, 2021).

In this regard, intrapersonal and interpersonal emotional competencies constitute complementary dimensions of emotional regulation. Intrapersonal competencies involve emotional awareness, clarity, and self-regulation processes that allow individuals to identify and manage their own emotional states effectively. Interpersonal competencies refer to the ability to recognize, understand, and respond adaptively to others' emotions, facilitating communication, social interaction, and conflict resolution (Goleman, 1995). Both dimensions are especially relevant in the university context, where students must navigate complex interpersonal environments while managing academic and personal demands.

Importantly, emotional regulation should not be conceptualized as an isolated psychological construct but rather as transferable life skills that influence behavioral choices and health-related habits. Emotional dysregulation has been linked to unhealthy lifestyle behaviors, including physical inactivity and poor dietary adherence, whereas adaptive emotional skills have been associated with greater self-care, persistence, and health-oriented decision-making (Massarwe & Cohen, 2023).

In the present protocol, life skills are operationalized as emotional regulation competencies and lifestyle-related behaviors that can be empirically assessed through psychological, behavioral, and functional indicators.

Active lifestyle and physical fitness within the biopsychosocial framework

Alongside emotional competencies, the adoption and maintenance of an active and healthy lifestyle represent another central pillar of student well-being. University years are a critical period for the consolidation of physical activity habits and dietary patterns that often persist into adulthood. However, evidence consistently shows a decline in physical activity levels and suboptimal nutritional behaviors during this life stage (Kumar & Kaufman, 2018).

Within the biopsychosocial model, physical exercise and healthy nutrition extend beyond their physiological benefits, contributing to psychological regulation, stress management, and social engagement. Physical activity has been associated with improvements in emotional regulation, motivation, and perceived competence, while objective indicators of physical fitness reflect functional health status and behavioral adherence to active lifestyles.

From an intervention perspective, integrating psychological skills training with structured physical exercise and psycho-nutritional education may generate synergistic effects, addressing multiple determinants of health simultaneously. This multicomponent approach responds to current evidence highlighting the limitations of single-component interventions and the need for coherent, theory-informed models in university health promotion.

Rationale for the present protocol

Despite growing interest in student well-being programs, existing interventions frequently focus on isolated outcomes (e.g., emotional skills or physical activity alone) and often lack sufficient methodological detail to ensure replicability. There is a clear need for structured, well-described protocols that integrate emotional regulation, healthy lifestyle behaviors, and objective physical performance indicators within a unified framework tailored to university students. Accordingly, the present study proposes a 12-week multicomponent intervention protocol grounded in the biopsychosocial model, in which emotional regulation skills (intrapersonal and interpersonal), lifestyle behaviors (physical activity and diet), and physical fitness outcomes are conceptualized as interrelated dimensions of students' integral health. Within this general aim, the protocol details the structure and content of the intervention components targeting intrapersonal and interpersonal emotional regulation, as well as their practical implementation procedures. In addition, it outlines the integration of structured physical exercise sessions and psycho-nutritional education within a unified intervention framework, consistent with a biopsychosocial perspective of health promotion. The protocol also defines the set of psychological, lifestyle, and physical performance variables selected to evaluate intervention feasibility and potential effects, and establishes standardized procedures for assessment, fidelity monitoring, and pre-post evaluation in a quasi-experimental university context.

Based on this conceptual and methodological framework, it is hypothesized that the implementation of the proposed 12-week multicomponent intervention will be feasible and methodologically robust, allowing for the detection of pre-post improvements in emotional regulation (both intrapersonal and interpersonal), lifestyle behaviors (physical activity levels and dietary adherence), and objective physical performance indicators among university students, compared with a control group.

Method

This study is a descriptive and explanatory analysis of the development and implementation of a quasi-experimental, longitudinal pre-post intervention protocol aimed at evaluating a multicomponent educational program targeting life skills development and active lifestyle promotion in university students. This design was selected as the most appropriate methodological option within the naturalistic academic context in which the intervention is implemented, where full randomization is not feasible due to organizational, curricular, and ethical constraints.

Specifically, random assignment of participants to experimental conditions is limited by the structure of university degree programs, fixed class schedules, and voluntary participation, which preclude the redistribution of students across groups without disrupting academic activities. For this reason, a non-randomized allocation strategy based on accessibility and institutional feasibility was employed, consistent with established methodological recommendations for educational and health-promotion interventions in real-world university settings (Vallvé et al., 2005).

The methodological structure of this protocol includes detailed procedures for participant recruitment, specifications of the psychological, behavioural, and physical components of the intervention, operational definitions of the variables under study, and the analytical strategies to be employed to evaluate changes across assessment time points. The study will incorporate two non-randomized groups, consisting of an Experimental Group (EG) and a Control Group (CG). The EG will participate in a 12-week structured intervention program that systematically integrates psychological training sessions, psycho-nutritional workshops, and weekly combined physical exercise sessions, whereas the CG will maintain their standard academic routine without exposure to the intervention.

To mitigate the potential biases associated with the absence of randomization, several methodological control strategies will be implemented. First, participants in both groups will be recruited from the same

institutional context and degree programs, and group allocation will be conducted to ensure comparable distributions of key baseline characteristics, including academic year, sex, and field of study. Second, both groups will undergo identical baseline (Pre-) and post-intervention (Post-) assessment procedures, using the same instruments, protocols, equipment, and testing conditions, thereby reducing measurement bias. Third, participants will be instructed to maintain their usual physical activity and lifestyle routines and to refrain from initiating new structured exercise, nutritional, or psychological programs during the intervention period in order to minimize confounding effects.

In addition, standardized intervention manuals, fixed session schedules, and systematic fidelity monitoring procedures will be employed to ensure consistency in the delivery of the experimental condition. Whenever possible, assessors responsible for data collection will remain blinded to group allocation, particularly for objective physical performance measures, further reducing the risk of observer bias. Statistical analyses will also account for baseline differences between groups when appropriate, reinforcing internal validity.

The intervention protocol has been developed and reported in accordance with the Template for Intervention Description and Replication (TIDieR) checklist (Hoffmann et al., 2014) and the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) guidelines (Vallvé et al., 2005), ensuring transparency, rigor, and replicability in non-randomized intervention research. Furthermore, the structure and reporting of the study align with the CONSORT 2010 recommendations adapted for non-randomized designs.

All procedures comply with the ethical principles of the Declaration of Helsinki and have received approval from the Ethics Committee of Universidad Europea (ID: 2036/2018). Written informed consent will be obtained from all participants prior to enrollment.

Intervention content, dosage, progression, and fidelity criteria

The intervention is structured as a 12-week multicomponent program combining psychological life-skills training, structured physical exercise, and psycho-nutritional education. All components are delivered following a standardized intervention manual developed by the research team to ensure consistency, replicability, and fidelity across sessions.

Psychological intervention component

The psychological component consists of one weekly group-based session (50 minutes) aimed at developing intrapersonal and interpersonal emotional regulation skills. Sessions follow an experiential–reflective methodology grounded in cognitive-emotional training, including guided self-reflection, emotional awareness exercises, role-playing, case analysis, and goal-setting tasks. Content is sequenced progressively, beginning with emotional awareness and identification (Weeks 1-2), followed by emotional clarity and self-regulation strategies (Weeks 3-5), interpersonal communication and conflict resolution skills (Weeks 6-7), emotional flexibility and coping strategies (Weeks 8-10), and integration and transfer to daily academic and personal contexts (Weeks 11-12). Each session includes brief psychoeducational input, structured practical activities, group discussion, and individual reflection tasks.

Physical exercise component: dosage and progression

Participants in the Experimental Group complete one supervised physical exercise session per week (60 minutes), delivered by a sports scientist. Sessions are structured into five phases: warm-up (10 min), main strength and/or aerobic block (35 min), complementary mobility or core work (10 min), and cool-down (5 min). Exercise intensity and volume follow a progressive overload principle adapted to a heterogeneous university population.

During Weeks 1-3, sessions emphasize familiarization, technical learning, and low-to-moderate intensity workloads (approximately 50-60% of estimated maximal capacity), focusing on mobility, core activation, and basic strength patterns. From Weeks 4-7, training progresses toward moderate intensity (60–70%), incorporating multi-joint strength exercises, aerobic interval work, and trunk stabilization. In Weeks 8–11, loads are further progressed to moderate levels (70-75%), combining strength, aerobic conditioning, and functional circuits. Week 12 emphasizes autonomous, integrative full-body training aimed at consolidating adaptive exercise habits.

Exercise intensity is monitored using heart rate monitors during aerobic tasks and perceived exertion scales to ensure individual safety and appropriate load adaptation. Exercises include standardized alternatives to accommodate participants' fitness levels or physical limitations, ensuring inclusivity and adherence.

Psycho-nutritional education component

Psycho-nutritional workshops are delivered once monthly (Weeks 5, 8, and 11) in 50-minute group sessions by a registered dietitian. Workshops focus on Mediterranean diet principles, nutrition–emotion interactions, portion control, and strategies for maintaining healthy eating behaviors in university contexts. Sessions combine practical demonstrations, interactive discussions, and self-monitoring activities to facilitate behavioral transfer.

Adaptations and adherence

Individual adaptations are permitted within predefined criteria (e.g., load reduction, exercise substitution, alternative emotional tasks) without altering core session objectives. Attendance of at least 80% of scheduled sessions is required to be considered adherent. Missed sessions are documented but not replaced.

Fidelity monitoring

Intervention fidelity is ensured through (a) a structured intervention manual, (b) fixed session schedules, (c) standardized materials, and (d) weekly fidelity logs completed by facilitators. Each log records session content delivered, deviations from protocol, participant engagement, and contextual factors affecting implementation. Fidelity reports are reviewed weekly by the principal investigators to ensure adherence to the intervention design and to document any procedural adjustments. The overall structure, content progression, and weekly distribution of the intervention components are summarized in Table 1.

Table 1. Schedule of research protocol activities.

Week	Type of session	Purpose	Session features	Duration	Materials	Responsible
W1	Psychological Session + Physical Exercise	Introduction to life skills and initial physical activation	Emotional awareness tasks; joint mobility & core activation	50 + 60 min	Worksheets, projector, mats, foam rollers	Educational Psychologist; Sports Scientist
W2	Psychological Session + Physical Exercise	Foundations of emotional regulation competencies	Self-reflection tasks; technique learning + low-intensity aerobic intervals	50 + 60 min	Self-reflection sheets, resistance bands, cones, mats	Educational Psychologist; Sports Scientist
W3	Psychological Session + Physical Exercise	Emotional clarity and self-regulation	Cognitive-emotional training; combined strength + mobility	50 + 60 min	Whiteboard, mats, light dumbbells	Educational Psychologist; Sports Scientist
W4	Psychological Session + Physical Exercise	Development of interpersonal communication	Group dynamics; posture–breathing work + progressive strength training	50 + 60 min	Role-play cards, projector, kettlebells, bands	Educational Psychologist; Sports Scientist
W5	Psychological Session + Physical Exercise + Psycho-nutritional Workshop	Integration of emotional and behavioural regulation	Repair strategies; aerobic intervals; nutrition content	50 + 60 + 50 min	Nutrition guides, food models, mats, HR monitors	Educational Psychologist; Sports Scientist; Registered Dietitian
W6	Psychological Session + Physical Exercise	Conflict-resolution skill development	Case-based learning; strength + core stabilization	50 + 60 min	Case sheets, stability balls, resistance bands	Educational Psychologist; Sports Scientist
W7	Psychological Session + Physical Exercise	Motivation and consolidation of life skills	Goal-setting tasks; aerobic progression + trunk stability	50 + 60 min	Goal sheets, markers, plyometric boxes, mats	Educational Psychologist; Sports Scientist
W8	Psychological Session + Physical Exercise + Psycho-nutritional Workshop	Behavioural change and lifestyle maintenance	Self-monitoring tasks; combined training; Mediterranean diet workshop	50 + 60 + 50 min	Food portion plates, tracking sheets, dumbbells	Educational Psychologist; Sports Scientist; Registered Dietitian

W9	Psychological Session + Physical Exercise	Emotional flexibility and adaptive coping	Emotion-regulation strategies; moderate-load strength progression	50 + 60 min	Scenario cards, barbell + plates (moderate), timers	Educational Psychologist; Sports Scientist
W10	Psychological Session + Physical Exercise	Strengthening of social skills	Interpersonal strategies; aerobic intervals + mobility	50 + 60 min	Projector, HR monitors, mats, bands	Educational Psychologist; Sports Scientist
W11	Psychological Session + Physical Exercise + Psycho-nutritional Workshop	Integration of lifestyle skills	Applied emotional tasks; strength + aerobic training; nutrition workshop	50 + 60 + 50 min	Infographics, kettlebells, cones, nutrition guides	Educational Psychologist; Sports Scientist; Registered Dietitian
W12	Psychological Session + Physical Exercise	Closure and transfer to daily contexts	Final reflective tasks; autonomy-oriented full-body training	50 + 60 min	Reflection sheets, mats, mixed equipment	Educational Psychologist; Sports Scientist

Participants

The target population for this quasi-experimental, longitudinal pre-post study comprises undergraduate university students enrolled in degree programs related to health, physical activity, and movement sciences. Specifically, the planned sample will include approximately 100 students aged between 18 and 25 years, registered in the bachelor's degrees in physical activity and sports sciences or physiotherapy at the participating university.

This population was selected due to its direct academic and professional linkage with the psychosocial, lifestyle, and physical fitness domains addressed in the intervention, as well as its practical feasibility within the academic setting where the program is implemented. The final sample size will be determined through an a priori power analysis using G*Power 3.1.2 (Faul et al., 2009), based on a repeated-measures design, as detailed in the statistical analysis section. Effect size estimates and power parameters will be informed by previous multicomponent psychological and lifestyle interventions conducted in comparable university populations.

Eligibility Criteria (pre-intervention)

Participants will be considered eligible for inclusion if they meet all of the following criteria prior to study enrollment:

- Be officially enrolled as undergraduate students (1st to 4th academic year) in the participating degree programs.
- Be aged 18 years or older at the time of recruitment.
- Provide written informed consent and agree to participate in all scheduled assessment procedures.
- Be able to participate safely in moderate-intensity physical exercise, as determined through self-reported health screening.

These eligibility criteria define the initial pool of participants prior to intervention exposure and data collection.

Exclusion Criteria

Participants will be excluded from the study if they meet any of the following conditions at baseline:

- Presence of medical or clinical conditions that contraindicate participation in psychological activities or physical exercise, including but not limited to uncontrolled cardiovascular, respiratory, neurological, metabolic, or musculoskeletal disorders.
- Current participation in structured psychological, nutritional, or physical activity intervention programs that could interfere with the study outcomes.
- Any condition or circumstance that, in the judgment of the research team, may compromise participant safety or protocol adherence.

These exclusion criteria are applied prior to group allocation to ensure participant safety and to minimize confounding influences.

Adherence and data-quality criteria (post-allocation)

In addition to the eligibility and exclusion criteria applied at baseline, the following criteria will be used post-allocation to define adherence and data quality for analytical purposes:

- Attendance of at least 80% of the scheduled intervention sessions (psychological, physical exercise, and psycho-nutritional components) for participants in the Experimental Group.
- Completion of both pre-intervention and post-intervention assessments with at least 90% of questionnaire items completed across all instruments.

Participants who do not meet these criteria will not be included in per-protocol analyses, although their data may be retained for exploratory or intention-to-treat sensitivity analyses when appropriate.

Participant recruitment and group allocation

Participant recruitment will be conducted using a non-probabilistic convenience sampling strategy within the university setting. Recruitment procedures will include in-class announcements, institutional email invitations, and informational briefings delivered by the research team during regularly scheduled academic sessions. Interested students will be invited to attend an information meeting in which the study objectives, procedures, time commitments, potential risks, and benefits will be explained in detail.

Given the educational context and organizational constraints of university teaching schedules, random allocation to groups is not feasible. Consequently, a non-randomized group allocation procedure will be employed. Participants who meet eligibility criteria will be assigned either to the Experimental Group (EG) or the Control Group (CG) based on timetable compatibility, availability, and academic scheduling, while actively seeking to achieve comparable distributions of key baseline characteristics (sex, academic year, and degree program) between groups.

The Experimental Group will participate in the full 12-week multicomponent intervention, whereas the Control Group will serve as passive control and will continue with their usual academic activities without exposure to any intervention components during the study period.

The non-randomized nature of group allocation entails a potential risk of selection bias. To address this limitation, multiple methodological strategies will be implemented: (a) recruitment from the same institutional and academic context, (b) baseline equivalence assessment of sociodemographic, psychological, lifestyle, and physical variables, (c) identical pre- and post-intervention assessment procedures across groups, and (d) statistical control of baseline differences when necessary. These measures are intended to strengthen internal validity and align with the recommendations of the TREND statement for non-randomized intervention studies.

Lifestyle-related life skills

Lifestyle-related life skills are conceptualized as behavioral competencies that translate emotional regulation capacities into health-promoting actions in daily life. In this protocol, these skills are assessed through diet quality and physical activity habits.

Adherence to a healthy dietary pattern is evaluated using the Mediterranean Diet Adherence Screener (MEDAS), a 14-item instrument with binary scoring (0–1 per item). Total scores range from 0 to 14, with scores ≥9 indicating adequate adherence to the Mediterranean diet. This instrument is widely used in epidemiological and intervention studies and reflects participants' capacity to adopt and maintain health-oriented nutritional behaviors.

Habitual physical activity and sport practice are assessed using the Physical Activity and Sports Practice Habits Questionnaire (C-PAFYD), which provides multidimensional information on physical activity engagement, including frequency, type, organization, motivational aspects, and continuity or discontinuation of practice. This questionnaire allows characterization of physical activity behaviors as an applied expression of active lifestyle skills in the university context.

Physical performance indicators

To complement self-reported lifestyle measures and to provide objective indicators of active behavior, three physical performance tests are included. These measures are not conceptualized as isolated fitness outcomes but as functional indicators of engagement in and adaptation to an active lifestyle.

Global muscular strength is assessed using the handgrip strength test, performed with a hydraulic hand-held dynamometer (Takei 5001, Japan; accuracy 0.1 kg), following standardized procedures. Lower-limb power is evaluated through the countermovement jump (CMJ), measured with an infrared system (Optojump, Microgate, Italy), using the best value from three attempts. Anaerobic performance and fatigue resistance are assessed using a 20-m repeated sprint ability (RSA) test consisting of six maximal sprints with 20-s recovery intervals, with sprint times recorded via photocell gates (Smartspeed, Fusion Sport, Australia).

These physical performance measures provide objective data on functional fitness and serve as complementary indicators of adherence to and effectiveness of the physical exercise component of the intervention.

Variables and instruments

In accordance with the conceptual framework of the present protocol, *life skills* are operationalized as a set of transferable psychological and behavioral competencies that enable adaptive functioning in academic, social, and health-related contexts. In this study, life skills are specifically conceptualized through (a) emotional regulation competencies at intrapersonal and interpersonal levels and (b) applied lifestyle-related behaviors, including physical activity, dietary habits, and functional physical performance. Accordingly, the selected variables and instruments are aligned with these dimensions. The alignment between independent, dependent, and controlled variables is presented in Table 2.

Emotional life skills: intrapersonal and interpersonal regulation

Intrapersonal and interpersonal life skills are primarily assessed through emotional regulation and emotional metacognition, which represent core components of emotional competence and adaptive self-management in young adults.

Emotional regulation strategies are evaluated using the Emotional Regulation Questionnaire (ERQ; Gross & John, 2003), in its Spanish-adapted version for adult populations (Pagano & Vizioli, 2021). The ERQ assesses two central regulatory strategies: cognitive reappraisal (6 items), reflecting adaptive intrapersonal regulation processes, and expressive suppression (3 items), reflecting less adaptive regulatory patterns that can affect both intrapersonal well-being and interpersonal functioning. Responses are rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The ERQ has demonstrated satisfactory reliability and validity in adult and university populations and is widely used as an indicator of emotional self-regulation skills.

Complementarily, emotional metacognition is assessed using the Trait Meta-Mood Scale (TMMS-24; Fernández et al., 2004), derived from the original scale by Salovey et al. (1995). The TMMS-24 evaluates three dimensions that reflect core emotional life skills: emotional attention, emotional clarity, and emotional repair, with eight items per dimension. Responses are provided on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). These dimensions capture individuals perceived capacity to attend to emotional states, understand them, and regulate them effectively, constituting key intrapersonal competencies with direct implications for interpersonal interactions and adaptive coping.

Together, the ERQ and TMMS-24 provide a theoretically coherent and empirically validated operationalization of emotional life skills at both intrapersonal and interpersonal levels, which are central targets of the psychological component of the intervention. A detailed description of the instruments, constructs assessed, and measurement characteristics is provided in Table 3.

Table 2. Revised alignment of variables in the study.

Independent Variables	Dependent Variables (Outcome domains)	Controlled / Intervening Variables
Intervention condition	Emotional life skills – Emotional regulation strategies: Cognitive reappraisal, Expressive suppression (ERQ) – Emotional metacognition: Attention, Clarity, Repair (TMMS-24)	Intervention exposure and structure – Session frequency and duration – Standardized session content and progression

Lifestyle-related life skills – Diet quality: Mediterranean diet adherence (MEDAS) – Physical activity and sport habits (C-PAFYD) Functional physical performance – Global strength (Handgrip) – Lower-limb power (CMJ) – Anaerobic performance and fatigue resistance (RSA)	Assessment control variables – Standardized testing conditions – Equipment calibration – Environmental stability – Participant pre-test conditions (rest, diet, activity) Adherence indicators – Attendance rate – Session engagement

Table 3. Instruments and constructs assessed.

Instrument	Construct measured (aligned with life skills framework)	Structure / Items	Response scale	Reference
Emotional Regulation Questionnaire (ERQ)	Emotional regulation strategies as intrapersonal and interpersonal emotional life skills (cognitive reappraisal, expressive suppression)	9 items (6 reappraisal, 3 suppression)	Likert 1–7	Gross & John (2003); Pagano & Vizioli (2021)
Trait Meta-Mood Scale (TMMS-24)	Emotional metacognition as intrapersonal emotional life skills (attention, clarity, repair)	24 items (8 per dimension)	Likert 1–5	Salovey et al. (1995); Fernández-Berrocal et al. (2004)
Mediterranean Diet Adherence Screener (MEDAS)	Dietary behavior as lifestyle-related life skills (Mediterranean diet adherence)	14 items	Binary scoring (0–1)	Estruch et al. (2013); Martínez-González et al. (2012)
C-PAFYD Questionnaire	Physical activity and sport habits as lifestyle-related life skills	Multidimensional questionnaire	Varies by item	Calderón et al. (2017)
Handgrip Strength Test	Global muscular strength as functional physical performance indicator	2 trials per hand	Best value in kg	Cronin et al. (2017)
Countermovement Jump (CMJ)	Lower-limb power as functional physical performance indicator	3 attempts (highest jump used)	Height in cm	Glatthorn et al. (2011)
Repeated Sprint Ability (RSA)	Anaerobic performance and fatigue resistance as functional physical performance indicator	6 × (20 + 20 m) with 20 s rest	Sprint time, fatigue index	Buchheit et al. (2010)

Procedure

The study procedure will follow a structured sequence composed of four phases: (1) orientation and familiarization, (2) baseline assessment, (3) 12-week intervention delivery, and (4) post-intervention assessment and monitoring. All procedures will be standardized to ensure replicability and methodological rigor

Orientation and Familiarization Phase

During the week prior to baseline assessments, participants will attend an orientation session in which they will receive detailed information about the study aims, structure, time requirements, and safety considerations. They will also be familiarized with the psychological instruments to be used (ERQ, TMMS 24, MEDAS, C PAFYD), along with standardized instructions for their completion.

A practical familiarization with the physical fitness tests (handgrip dynamometry, countermovement jump, and repeated sprint ability) will be conducted to ensure appropriate technique and to minimize learning effects during the baseline evaluation

Baseline Assessment

Between 48 and 96 hours after the familiarization phase, participants will undergo the pre-intervention assessment. They will first complete the full questionnaire battery under supervision, followed by the physical testing protocol administered in the following sequence: (1) handgrip strength test, (2) CMJ test, and (3) RSA test.

All assessments will be carried out under controlled environmental conditions, at a fixed time window for each participant (±1.5 h), and using calibrated equipment with unified testing instructions. Prior to testing, participants will be instructed to avoid strenuous physical activity for 24–48 hours and to maintain their usual sleep and dietary routines to ensure stable pre-test conditions.

Intervention Delivery (12-Week)

Participants assigned to the Experimental Group will participate in a 12-week multicomponent intervention consisting of:

(a) one weekly psychological life skills session (50 min), (b) one monthly psycho-nutritional workshop (50 min), and (c) one weekly combined physical exercise session (60 min).

All sessions will be delivered following a standardized implementation manual that will specify instructional content, session objectives, methodological sequence, required materials, and professional roles. Psychological sessions will be delivered by an educational psychologist, psycho-nutritional workshops by a registered dietitian, and physical exercise sessions by a sports scientist. The intervention schedule will remain constant throughout the 12-week to ensure procedural consistency.

A fidelity monitoring system will be implemented throughout the intervention. At the end of each week, facilitators will complete a structured report documenting adherence to the session protocol, participant attendance, engagement levels, contextual contingencies, and any deviations from the prescribed procedures. These reports will be reviewed weekly by the principal investigators to ensure intervention integrity.

To minimize potential confounding factors, all participants will be instructed to refrain from initiating new training programs, nutritional regimens, or psychological interventions during the study period. Attendance below 80% will be classified as low adherence.

Post Intervention Assessment

Within 3-5 days following completion of the 12-week intervention, participants will complete the post-intervention assessment. The entire pre-test battery will be repeated in identical order and under the same environmental, temporal, and methodological conditions. Equipment calibration, warm up protocols, and verbal instructions will remain unchanged to ensure valid pre–post comparisons. Participants will again be instructed to avoid high intensity physical activity for 24–48 hours prior to testing and to replicate their baseline sleep and nutritional routines

Safety Monitoring and Data Management

Throughout all study phases, any adverse events, discomfort, or procedural incidents will be documented by the supervising staff and reviewed by the research coordination team. Participation may be paused or discontinued if medical or safety criteria are not met.

Data entry will be conducted in pre structured templates and verified using a double entry procedure. When possible, test assessors will remain unaware of participant group allocation. Device based outcome measures (e.g., jump height, sprint times, grip strength) will be used to minimize subjective influence and ensure objective data collection.

To corroborate the effects of implementing a methodology in the educational field, Hastie & Casey (2014), weekly supervision of the intervention will be conducted through the following ad-hoc questions, to assess how the program is being implemented. These questions will be reviewed and discussed by the principal investigators:

a) "Do you perceive that circumstances have arisen that have made it more challenging to carry out the program activities?"

b) "What do you think is necessary to improve the development of the sessions?"

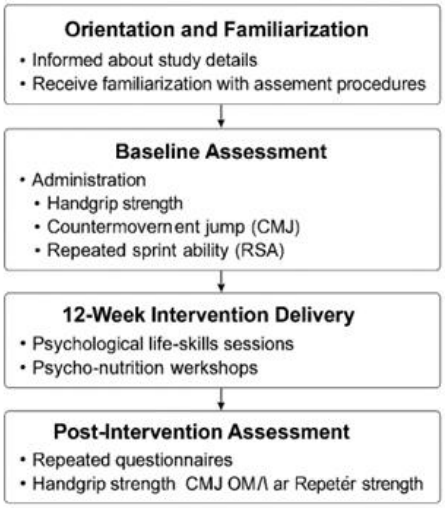
c) "What is your level of satisfaction with the program's development?"

d) "Specify what aspects you attribute to that level of satisfaction"

e) "Have you modified any organizational or content aspects of the sessions?

The overall procedural flow is summarized in Figure 1.

Figure 1. Flow diagram of the intervention design procedure.



Note: The methodological sequence includes: (1) orientation and familiarisation phase, where participants receive detailed information about the study and practise the assessment procedures; (2) baseline assessment (pre-test), which includes the administration of psychological questionnaires and standardised physical tests; (3) implementation of the 12-week multicomponent programme, consisting of weekly psychological sessions, monthly psychonutrition workshops and combined physical exercise sessions; and (4) post-test, conducted under the same conditions, equipment and test order as the initial assessment to ensure pre-post comparability of the measures.

Statistical analysis

All statistical analyses will be conducted following APA 7th edition reporting standards. Descriptive statistics will be calculated for all study variables at baseline and post-intervention, including means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Baseline equivalence between groups will be examined using independent-samples t tests or χ^2 tests, as appropriate.

Primary analytical model

The primary analytical approach will be based on a general linear model for repeated measures, with time (pre-intervention, post-intervention) as a within-subject factor and group (Experimental vs. Control) as a between-subject factor. This model allows direct testing of the time × group interaction, which constitutes the principal effect of interest in the present quasi-experimental longitudinal design.

Separate repeated-measures models will be estimated for each outcome domain (emotional life skills, lifestyle-related behaviors, and physical performance indicators) in order to preserve interpretability and reduce model over-complexity. This approach is consistent with the conceptual structure of the intervention and avoids inflating Type I error through indiscriminate multivariate aggregation.

Covariates and control variables

When relevant, baseline values of the outcome variables, age, sex, academic year, and attendance rate will be included as covariates to adjust for potential baseline imbalance and differential intervention exposure. The inclusion of covariates will be theoretically justified and limited to variables that plausibly influence the outcomes, in line with recommendations for non-randomized intervention designs.

Assumptions and robust alternatives

Model assumptions (normality of residuals, homogeneity of variance, and sphericity) will be evaluated using graphical inspection and standard diagnostics. In case of moderate deviations from normality, analyses will rely on the robustness of repeated-measures general linear models, particularly given balanced group sizes. If severe violations are detected and cannot be addressed through transformation, equivalent rank-based longitudinal models will be employed to preserve the within-subject structure of the design, rather than resorting to separate non-parametric tests that ignore repeated measures dependency.

This strategy ensures that the longitudinal logic of the design is retained even when distributional assumptions are not fully met.

Missing data and attrition

Analyses will primarily follow a per-protocol approach, including participants who meet predefined adherence and data-quality criteria. In addition, sensitivity analyses will be conducted using an intention-to-treat framework when feasible, applying appropriate missing-data handling procedures (e.g., multiple imputation or maximum likelihood estimation), under the assumption that data are missing at random. Attrition rates and reasons for dropouts will be reported transparently.

Multiple comparisons and effect size reporting

Given the presence of multiple related outcomes, statistical inference will focus on the pattern and consistency of effects across outcome domains rather than isolated p-values. When necessary, adjustments for multiple comparisons will be applied using Holm–Bonferroni procedures within each outcome domain. Effect sizes (partial η^2 for repeated-measures models and standardized mean differences for pairwise contrasts), along with 95% confidence intervals, will be systematically reported to facilitate practical interpretation.

Analyses will be conducted using SPSS (v25) and Jamovi (v2.3).

Sample size justification and statistical power

A priori power analysis was conducted using G*Power 3.1.2 to estimate the minimum sample size required to detect the primary effect of interest, namely the time × group interaction in a repeated-measures design. The calculation was based on a repeated-measures ANOVA, within–between interaction, with the following parameters:

- Statistical test: Repeated-measures ANOVA, within-between interaction
- Effect size: $f = 0.25$ (medium effect)
- α level: .05
- Statistical power (1-β): .80
- Number of groups: 2 (Experimental, Control)
- Number of measurements: 2 (Pre, Post)
- Correlation among repeated measures: 0.60
- Nonsphericity correction (ε): 1.00

The selected effect size ($f = 0.25$) reflects a moderate intervention effect, consistent with previous multicomponent psychological and lifestyle interventions in university populations, where changes in emotional regulation and health-related behaviors typically fall within the small-to-moderate range. Under these parameters, the minimum required sample size was estimated at 82 participants.

To account for an anticipated attrition rate of approximately 10–15%, which is common in longitudinal educational interventions, the planned recruitment target was set at approximately 100 university students. This sample size ensures adequate statistical power to detect meaningful intervention effects while maintaining robustness against potential data loss.

Anticipated relevance and potential contribution

This protocol describes the theoretical and methodological foundations of a 12-week multicomponent intervention designed to target emotional life skills, lifestyle-related behaviors, and functional physical performance in university students. Rather than presuming specific intervention effects, the purpose of this protocol is to outline a structured, replicable framework that enables the systematic evaluation of changes in emotional regulation capacities, health-related behaviors, and objective indicators of physical function within a biopsychosocial perspective.

By integrating psychological training, psycho-nutrition education, and structured physical exercise into a single intervention model, the protocol responds to current calls for well-specified, theory-informed programs in higher education settings. Recent literature has highlighted both the growing mental-health needs of university students and the limitations of existing interventions, which often rely on single components, heterogeneous designs, or insufficient reporting detail (Charbonnier et al., 2023; Zhao et al., 2025). In this context, the present protocol provides a transparent and operational blueprint that may facilitate future empirical testing and cross-study comparison.

From a methodological standpoint, the protocol emphasizes standardized intervention delivery, predefined fidelity criteria, multimethod assessment, and a longitudinal group-comparison design. These features directly address gaps identified in recent reviews, including limited reproducibility, conceptual ambiguity, and weak implementation reporting in student well-being interventions (Amaro et al., 2025; Abulfaraj et al., 2024). Importantly, the inclusion of both self-reported measures and objective physical-performance indicators allows for a more comprehensive assessment of lifestyle-related processes than approaches relying exclusively on subjective outcomes (Romo et al., 2025).

The relevance of the proposed protocol lies therefore not in demonstrating intervention effectiveness per se, but in establishing a coherent methodological framework through which emotional and lifestyle-related life skills can be empirically examined in university populations. The protocol is intended to serve as a foundation for subsequent evaluative studies and to support the development of scalable and transferable health-promotion initiatives within higher education.

Educational and societal relevance

Given the academic profiles of the target population, which include future professionals in education, health, and sport sciences, the protocol has potential relevance beyond the immediate study context. Fundamentally, it highlights the importance of transforming academic environments through critical reflection on bodily experiences, emotions and interpersonal relationships (González, 2024).

If subsequently evaluated and refined, the intervention framework may inform educational practices aimed at fostering emotional competencies and healthy lifestyles in academic and community settings. In this sense, the protocol aligns with broader institutional and public-health objectives related to student well-being, prevention, and sustainable health promotion (World Health Organization, 2017), while remaining appropriately cautious regarding claims of impact at this stage.

Conclusions

This article presents a detailed methodological protocol for the design and implementation of a 12-week multicomponent intervention aimed at addressing emotional life skills, lifestyle-related behaviors, and functional physical performance in university students. The primary contribution of the study lies in the transparent description of the intervention structure, theoretical rationale, implementation procedures, assessment strategy, and fidelity-monitoring criteria, rather than in the demonstration of intervention effects.

By integrating psychological training, psycho-nutritional education, and structured physical exercise within a single framework, the protocol offers a coherent methodological approach aligned with current biopsychosocial perspectives on student well-being. Importantly, the protocol delineates how these components can be operationalized, delivered, and evaluated in a real-world university context, providing sufficient detail to support replication and future empirical testing.

The proposed design explicitly acknowledges its methodological constraints, including the use of a quasi-experimental allocation strategy, reliance on self-report measures for part of the assessment, and the absence of long-term follow-up. These limitations are inherent to the applied educational setting and underscore the need for subsequent studies employing randomized designs, extended follow-up periods, and multi-site implementations to evaluate intervention effectiveness and generalizability.

In summary, this protocol contributes methodological clarity and conceptual coherence to the field of university-based health-promotion research. It is intended to serve as a foundation for future evaluative studies rather than as evidence of intervention efficacy, and to support the development of rigorously

designed, theory-informed interventions targeting emotional and lifestyle-related competencies in higher education settings.

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References

Abulfaraj, G. G., Upsher, R., Zavos, H. M. S., & Dommett, E. J. (2024). The impact of resilience interventions on university students' mental health and well-being: A systematic review. *Education Sciences, 14*(5), 510. https://doi.org/10.3390/educsci14050510

Amaro, P., Fonseca, C., Pereira, A., Afonso, A., Barros, M. L., Serra, I., Marques, M. F., Erfidan, C., & Valente, S. (2025). Mental health promoting intervention models in university students: A systematic review and meta-analysis protocol. *BMJ Open, 15*, e091297. https://doi.org/10.1136/bmjopen-2024-091297

Auerbach, R. P., Mortier, P., Bruffaerts, R., Alonso, J., Benjet, C., Cuijpers, P., Demyttenaere, K., Ebert, D. D., Green, J. G., Hasking, P., Murray, E., Nock, M. K., Pinder-Amaker, S., Sampson, N. A., Stein, D. J., Vilagut, G., Zaslavsky, A. M., & Kessler, R. C. (2018). The WHO World Mental Health Surveys International College Student Project: Prevalence and distribution of mental disorders. *Journal of Abnormal Psychology, 127*(7), 623–638. https://doi.org/10.1037/abn0000362

Charbonnier, E., Le Vigouroux, S., Puechlong, C., Montalescot, L., Goncalves, A., Baussard, L., Gisclard, B., Philippe, A. G., & Lespiau, F. (2023). The effect of intervention approaches of emotion regulation and learning strategies on students' learning and mental health. Inquiry: The *Journal of Health Care Organization, Provision, and Financing, 60*, 1–14. https://doi.org/10.1177/00469580231159962

Chen, S., & Bonanno, G. A. (2021). Components of emotion regulation flexibility: Linking latent profiles to depressive and anxious symptoms. *Clinical Psychological Science, 9(*2), 236–251. https://doi.org/10.1177/2167702620956972

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.).* Lawrence Erlbaum Associates.

Cronin, J., Lawton, T. W., Harris, N., Kilding, A. E., & McMaster, D. T. (2017). A brief review of handgrip strength and sport performance. *Journal of Strength and Conditioning Research*, 31(11), 3187-3217. https://doi.org/10.1519/JSC.0000000000002202

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41(*4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Fernández, P., Extremera, N., & Ramos, N. (2004). Validity and reliability of the Spanish modified version of the Trait Meta-Mood Scale. *Psychological Reports, 94*(3), 751-755. https://doi.org/10.2466/pr0.94.3.751-755.

Goleman, D. (1995). *Emotional intelligence: Why it can matter more than IQ*. Bantam Books.

González, S. L. A. (2024). El disfrute, desarrollo, cuidado de la vida y comprensión de los desafíos del ámbito pedagógico desde la corporeidad. *Retos*, *54*, 602-608. https://doi.org/10.47197/retos.v54.99909

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85(*2), 348-362. https://doi.org/10.1037/0022-3514.85.2.348

Hastie, P. A., & Casey, A. (2014). Fidelity in models-based practice research in sport pedagogy: A guide for future investigations. *Journal of Teaching in Physical Education, 33*(3), 422-431. https://doi.org/10.1123/jtpe.2013-0141

Hoffmann, T. C., Glasziou, P., Boutron, I., Milne, R., Perera, R., Moher, D., & Michie, S. (2014). Better reporting of interventions: Template for intervention description and replication (TIDieR) checklist and guide. *The BMJ, 348*, g1687. https://doi.org/10.1136/bmj.g1687

Kumar, S., & Kaufman, T. (2018). Childhood obesity. *Panminerva Medica, 60*(4), 200-212. https://doi.org/10.23736/S0031-0808.18.03557-7

Massarwe, A., & Cohen, N. (2023). Understanding the benefits of extrinsic emotion regulation in depression. *Frontiers in Psychology, 14*, 1120653. https://doi.org/10.3389/fpsyg.2023.1120653

Pagano, A. E., & Vizioli, N. A. (2021). Adaptación del Cuestionario de Regulación Emocional (ERQ) en población adulta de la Ciudad Autónoma de Buenos Aires y el Conurbano Bonaerense. *Revista Psicodebate: Psicología, Cultura y Sociedad, 21*(1), 18-32. https://doi.org/10.18682/pd.v21i1.3881

Romo, J., Pérez, J. C., Cumsille, P., Hollenstein, T., Olaya Torres, A., Rodríguez Rivas, M. E., & Melero, J. (2025). Emotion regulation strategies and academic achievement among secondary and university students: A systematic review and meta-analysis. *Educational Psychology Review, 37*(3). https://doi.org/10.1007/s10648-025-10054-y

Salovey, P., Mayer, J. D., Goldman, S. L., Turvey, C., & 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* (pp. 125–154). American Psychological Association. https://doi.org/10.1037/10182-006

Vallvé, C., Artés, M., & Cobo, E. (2005). Non-randomised intervention studies (TREND). *Medicina Clínica, 125*(Supl 1), 38-42.

World Health Organization. (2010). *The world health report 2010: Health systems financing: The path to universal coverage.*

World Health Organization. (2017). *Tracking universal health coverage: 2017 global monitoring report*. https://www.who.int/publications/i/item/9789241513555

Zhao, G. X., Zhao, M. Y., Bean, C. R., Robbins, A. S., & Mahrer, N. E. (2025). Well-being interventions in U.S. colleges: A scoping review from a positive higher education perspective. *Frontiers in Psychology, 16*, 1601955. https://doi.org/10.3389/fpsyg.2025.1601955

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