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Editorial

The current issue of the journal brings together research addressing current challenges in applied psychology across diverse and socially relevant contexts. The first article presents a pioneering study on the Growing in Mindfulness (GEM) therapeutic play program applied to adolescents in conflict with the law detained at the Jalteva Juvenile Detention Center (CPI) in Honduras. The research explores the effectiveness of a play-based mindfulness intervention in an institutional setting with significant structural limitations. The results indicate improvements in uncertainty about the future and in perceived social support, although an increase in aggressive behavior was also observed. This work provides relevant evidence for advancing interventions adapted to juvenile justice settings.

The following article addresses the prevention and management of stress and anxiety in employees working remotely, a modality that has intensified since the pandemic. Using a quantitative approach, the authors identify high levels of emotional tension, physical symptoms, and regulation difficulties among employees of a banking institution. Based on these findings, the Ataraxia program was designed and validated, aimed at strengthening coping skills and improving workplace well-being. The study provides tools applicable to organizations seeking to support the mental health of their teams.

The third article presents the design of a life project model as a preventive strategy against youth violence among Peruvian high school students. Based on an epistemological analysis and validated by experts, the program proposes fourteen sessions that address identity, values, goals, and meaning in life as protective factors. The research links the loss of purpose with an increase in violent behavior, highlighting the need for preventive interventions that strengthen personal projection and holistic development in adolescence.

The fourth contribution examines the relationship between attributional styles and risky driving behaviors, underscoring the role of locus of control, stability, and perceived controllability as predictors of driving behavior. The results show that an internal locus of control and a stable attribution are linked to more aggressive behaviors, while greater controllability acts as a protective factor. The study provides useful evidence for the design of road safety interventions, highlighting the relevance of cognitive and emotional biases in prevention. The following article analyzes alcohol consumption among Ecuadorian university students in open and distance learning programs, highlighting the role of perceived stress and psychological inflexibility as key transdiagnostic variables. The results show that higher consumption significantly increases both variables, suggesting that alcohol functions as a maladaptive coping strategy. The study underscores the need for interventions that incorporate stress management and psychological flexibility to prevent dependence and promote mental health in university populations.

The sixth contribution evaluates the psychometric properties of the Instrument for Measuring Algebraic Proficiency (IMDA) in Mexican student teachers to determine its validity for larger-scale applications. With a sample of 333 participants, the results confirm adequate reliability ($KR-20 = .84$) and acceptable quality for all items, as well as consistent explained variability through multiple regression. The study demonstrates that the IMDA is robust, useful for formative assessment, and transferable to diverse teaching contexts. The seventh article validates the Credibility Discourse Analysis (CDA) protocol as a tool for differentiating truthful and deceptive discourse in adult statements, integrating previous criteria from CBCA, RM, SCAN, and IDA into a single quantitative system. Applied to 320 testimonies from the MU3D, the CDA identified linguistic patterns characteristic of lying with 85% accuracy, significantly surpassing average human judgment.

The final article analyzes the relationship between anxiety and anger suppression in a large Mexican sample, revealing that women exhibit twice the anxiety symptoms of men, as well as higher levels of anger and emotional restraint. The results show positive correlations between trait anxiety, trait anger, and internal expression of anger, in addition to a robust predictive model where emotional suppression and sex explain a large part of the variance in anxiety. The study highlights relevant clinical implications for emotional and preventative approaches.

Dr. Juan Luís Martín Ayala
Editor Jefe / Editor in chief / Editor Chefe

PROPOSAL FOR THE PRIMARY EDUCATION DEGREE FROM THE AREA OF PHYSICAL EDUCATION

Propuesta interdisciplinaria para el grado de educación primaria desde el área de la educación física

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ABSTRACT

Keywords:

Service Learning, Inter-level proposal, Educational innovation.

The educational proposal consists of a themed gymkhana designed to welcome new students to the Sagrada Familia University Center, specifically in the Primary and Early Childhood Education programs. It aims to foster integration, cooperation, and the development of social and entrepreneurial skills among the participating students, combining various challenges across multiple areas of knowledge—such as science, history, language, nature, and sports—while promoting teamwork and a positive, motivating environment. The methodology integrates active approaches such as Project-Based Learning, Cooperative Learning, and Service Learning. In addition, the activity could be extended to primary schools, providing real teaching practice and enriching the educational experience. The plan includes phases of preparation, implementation, and evaluation, encouraging leadership and organizational skills among senior students. Overall, it is an interdisciplinary and innovative proposal that blends play and learning to support students' professional and personal growth.

RESUMEN

Palabras clave:

La propuesta educativa consiste en una gincana temática diseñada para la bienvenida de estudiantes de nuevo ingreso en el Centro Universitario Sagrada Familia, específicamente en los grados de Educación Primaria y

Metodologías activas, Aprendizaje Servicio, Propuesta Internivelar, Innovación educativa.

Educación Infantil. Esta pretende fomentar la integración, la cooperación y el desarrollo de competencias sociales y emprendedoras en los alumnos implicados, combinando diferentes pruebas en múltiples áreas del conocimiento, como ciencias, historia, lengua, naturaleza y deporte y promoviendo el trabajo en equipo y un ambiente positivo y motivador. La metodología utilizada combina enfoques activos como el Aprendizaje Basado en Proyectos, el Aprendizaje Cooperativo y el Aprendizaje Servicio. Además, se plantea la posibilidad de extender la actividad a centros escolares de Primaria, facilitando prácticas docentes reales y enriqueciendo la experiencia educativa. La planificación incluye fases de preparación, desarrollo y evaluación, promoviendo el liderazgo y la organización entre los alumnos de cursos superiores. En definitiva, se trata de una propuesta interdisciplinar e innovadora que combina juego y aprendizaje, para facilitar el crecimiento profesional y personal de los estudiantes.

Introduction

With the changes that education has undergone in recent years thanks to research, it is of utmost importance to promote and incorporate didactics that are not only based solely on teaching the contents described in the curriculum of the Primary Education Degree, but also promote and develop social, moral and ethical values necessary for the development of teaching work once the initial training period is over. As already mentioned by Traver and García in 2009, values education must start from the immediate reality and the real culture of the subjects involved, so it is essential that these values are worked on in a practical, transversal and interdisciplinary way through proposals that involve social interaction.

Based on this aspect and using the game as a socializing dynamic, as a means to improve teamwork and interpersonal relationships, in an atmosphere of joy and well-being (Díaz, 2022), we seek to propose an innovative and interdisciplinary alternative that facilitates university students to put into practice the knowledge acquired in the area of Physical Education, as well as to visualize it as a useful reference to promote their ability to develop in their professional future with greater effectiveness. In addition, the aim is to positively influence the motivation of students belonging to the university degree of Primary Education, since this allows students to adapt to diverse cultural styles, as well as to active methodologies and to assume with normality the differences among their peers (Makhambetova, Zhiyenbayeva, & Ergesheva, 2021).

Thus, we propose an interdisciplinary and multidisciplinary educational project that starts from the Service for the Development of Entrepreneurial Competence, Orientation and Labor Insertion of the Sagrada Familia University Center to dynamize the welcome days, through the development of a thematic gymkhana aimed at new students and coordinated by students of higher grades, whose organization and preparation aims to promote both the integration of students who must work in teams, as well as the formation of a socio-affective link sustained by the values necessary for cooperation such as empathy, tolerance and mutual respect. In fact, this proposal aims to lay the foundations for an educational environment based on cooperative work, peer education and the creation of positive attitudes towards teaching. Moreover, according to Laguna (2015), it favors the valuation and personal self-esteem of students, the creation of a more positive attitude towards others and the integration of students with difficulties in socializing. On the other hand, the student organizer will acquire entrepreneurial and learning-to-learn skills that will generate benefits upon graduation.

Theoretical Framework

The implementation of interdisciplinary projects in Primary Education is essential to promote comprehensive learning that connects diverse areas of knowledge. This approach allows students to establish meaningful connections between subjects, favoring a deeper and more contextualized understanding of the content. In addition, the interdisciplinary methodology enhances the development of critical thinking, collaboration and social skills, essential aspects for cognitive, social and emotional growth at this educational stage. Recent studies have shown that working through interdisciplinary projects, especially those that include problem-solving and experimental tasks, contributes significantly to the development of critical thinking in elementary school students (Education Sciences, 2025). Likewise, it has been shown that

this approach favors collaboration among students, promoting social and emotional skills that are fundamental for their integral development (Artis Foundation, 2025).

On the other hand, as indicated in *Article 18*. According to Law 17/2007, of December 10, 2007, on Education in Andalusia, *initial teacher training* must cover both the acquisition of knowledge and the development of skills and aptitudes, the essential component being the permanent and interactive relationship between theory and practice and the preparation for the management of teaching and learning processes and the personal development of students, and whose ultimate goal is to prepare teachers to respond to the challenges of the educational system set forth in the Law. Therefore, students of the Primary and Early Childhood Education degree must acquire during their training those knowledge, competences, attitudes and aptitudes that allow them to fulfill the functions of the teaching staff indicated in article 91 of the third title of the Organic Law 2/2006, of May 3, on Education. These include the following:

- The promotion, organization and participation in complementary activities, inside or outside the school grounds, programmed by the centers.
- The contribution to ensure that the center's activities take place in a climate of respect, tolerance, participation and freedom in order to foster in students the values of democratic citizenship and the culture of peace.
- Participation in the general activity of the center.
- Research, experimentation and continuous improvement of the corresponding teaching processes.
- The performance of the above functions by teachers, under the principle of collaboration and teamwork.

In addition, Article 27, "Teaching programs", of Decree 328/2010, of July 13, 2010, which approves the Organic Regulations of second-grade nursery schools, pre-schools and primary schools, and specific public special education centers, states that the cycle teams are in charge of preparing the teaching programs and the teaching staff is responsible for approving them. One of the aspects requested is the teaching competence in the development of methodologies to be applied, so teachers must be updated in the different existing teaching-learning processes, as well as trained to put them into practice. On the other hand, Article 81 of the aforementioned Decree establishes the following with respect to the competencies of the cycle teams:

These are the competencies of the cycle teams:

b) To prepare the didactic programs or, as the case may be, the corresponding pedagogical proposals, in accordance with the educational project.

f) Promote, organize and carry out complementary and extracurricular activities, in accordance with current regulations.

g) To keep the teaching methodology up to date, especially that which favors the development of skills in early childhood education students and basic competencies in primary education students.

Likewise, Article 66 defines the competencies of the Faculty Senate:

These are competencies of the Faculty Senate:

e) To promote initiatives in the field of experimentation, innovation and pedagogical research, as well as in the training of the center's teaching staff.

l) Propose measures and initiatives that favor coexistence in the center

As a consequence of the above, future teachers must be able to propose innovative teaching methodologies, among which the following stand out:

- Service Learning (SL)

When we speak of PSA, we refer to those educational activities or experiences that combine service to the community with the learning of knowledge, skills and/or values. This educational proposal has a positive impact on the volunteer who carries them out, since they contribute to a complex understanding of reality and to the formation of personal attitudes and values for social transformation (Cid Romero et al. 2025; Garcia Romero & Lalueza, 2019).

In addition, studies such as that of Furco (2004), have already reinforced the positive impact that students experience in the development of conceptual knowledge and skills, in addition to the increase in their motivation with respect to school. Vocationally and professionally, they also benefit from improved professional skills and better preparation for the world of work through exposure to real-life situations. Finally, it also helps the students' classroom climate by favoring companionship, teamwork skills and prosocial behaviors.

- Project-Based Learning (PBL)

According to Sosa Cortéz et al. (2025) and Trujillo (2015), PBL is defined as a methodology that allows students to acquire knowledge and key competencies in the 21st century through the development of projects that respond to real-life problems. In addition, García-Varcácel and Basilotta (2017), defend that it is a different way of working that encourages inquiry, individual and autonomous learning of students, by acquiring a greater commitment to learning and, also, Blázquez (2016) indicates that project work fosters communication and cooperation among the agents involved, since they are usually carried out in cooperative groups.

During the development of a project, students have the opportunity to explore and discover their interests, formulate relevant questions, organize their work autonomously and search for information from various sources. Throughout the process, they share their ideas, compare them with new knowledge, communicate their findings and develop proposals based on their learning.

This is why Project Based Learning represents an active methodology that stimulates student interest and participation. By promoting autonomy, research and teamwork, it becomes a key pedagogical tool for the development of competencies.

- Cooperative Learning (CL)

Another of the main methodologies that promote entrepreneurship and learning to learn AC. However, in spite of being a didactic proposal that has been commonly used in classrooms in recent years, it is difficult to establish a definition given that there are several aspects involved. According to Fernández-Río (2017), this approach is defined as a pedagogical model in which students learn with, from and by other students through a teaching-learning approach that facilitates and enhances this positive interaction and interdependence and in which teacher and students act as co-learners. In addition, other authors such as Velázquez Callado (2018), defend that this approach is based on the creation of small heterogeneous work groups, where students cooperate to achieve common goals, taking responsibility for both their own learning and that of their peers

Therefore, it could be concluded that cooperative learning is a didactic and methodological tool that allows the development of social and intellectual skills, capable of improving the academic performance of students, and for which a series of resources, actions and teaching decisions related to the autonomy, work and achievement of student objectives are needed.

Pavié (2011) considers the concept of competence as a dynamic combination of cognitive and metacognitive, knowledge and understanding, interpersonal, intellectual and practical skills, as well as ethical values. In this sense, another relevant aspect at a

theoretical level is the acquisition of competencies necessary for teacher training during their initial training, among which are:

- Learning to Learn

According to the European Commission (2018), Learning to Learn is the ability to reflect on oneself, manage time and information effectively, collaborate with others constructively, maintain resilience, and manage one's own learning and career. It also includes the ability to cope with uncertainty and complexity, contribute to one's physical and emotional well-being, express empathy and manage conflict. Along the same lines, Bolívar (2009), Mauri & Rochera (2010) and Teixidó (2010) work on this competence during school age, as a preparation to face challenges and demands in specific contexts, within a changing world, in an autonomous and self-regulated manner throughout life.

This is of paramount importance in teacher training, and is included in the RUCT report of the Infant and Primary Education degrees, as a basic competence.

Therefore, and following the guidelines listed below, the proposal presented below will be appropriate to contribute to the development of this competence in students, since it will require a correct management of time and information, a coordinated, constructive and resilient collaboration among them, as well as a broad ability to adapt and cope with uncertainty and the ability to commit and take responsibility for the project and for the physical, emotional and mental wellbeing of its participants.

- Entrepreneurial Competence

Entrepreneurial competence is a key skill for the integral development of individuals and their adaptation to current challenges. In education, its objective is not only to encourage the creation of companies, but also to develop initiative, creativity and the ability to transform ideas into concrete actions. Since the early twentieth century, authors such as Dewey (1933) and Kilpatrick (1918) promoted active methodologies such as project-based learning to strengthen this competence, highlighting its value in the formation of active and committed citizens.

The European Parliament and the Council (2006) have recognized initiative and entrepreneurship as one of the eight key competencies for lifelong learning. Furthermore, in Spain, the LOMLOE (Organic Law 3/2020) reinforces its integration in the school curriculum, promoting its transversal development in different areas of knowledge. Authors such as Pertuz-Peralta (2016), highlight the need to incorporate in the training and professional updating of teachers strategies and methodologies that promote entrepreneurship, integrating theoretical and practical aspects that allow the educator to promote a culture of entrepreneurship in the classroom.

This is why entrepreneurial competence not only promotes the creation of new projects, but also trains individuals with the capacity to adapt, critical thinking and leadership. Its inclusion in education responds to the need to prepare young people for a constantly changing world, promoting their autonomy, creativity and social commitment.

Likewise, it is necessary to refer to article four of Decree 101/2023, of May 9, which defends the integration of different experiences and learning of students from a global perspective as an educational principle.

Folch Dávila et al. (2020) publish an interdisciplinary project in the areas of Physical Education, Music Education and Visual and Plastic Education for the initial training of future teachers at Ramón Llull University. Its objective is to achieve significant learning in students through real practices in which co-teaching, cooperative learning and formative evaluation are worked on.

Description of the Proposal

The didactic proposal *The Four Kingdoms* was the winning project of the Ideas Competition for the Transformation of the University Center, promoted by the Service for the Development of Entrepreneurial Competence, Guidance and Job Placement of the Sagrada Familia University Center.

This proposal was selected among the finalist projects, for its purpose of carrying out an educational practice that would facilitate the learning of the curricular competencies of the students of the Primary Education degree, fundamentally those of entrepreneurship and learning to learn, as well as for the innovative methodologies on which it was based, and for the possibility of transferring it to a school context in Primary Education.

The four kingdoms is a playful proposal, with a marked interdisciplinary and multidisciplinary character that, although it was conceived from the area of Physical Education, was perfectly globalized with other subjects of the degree related to the areas of Science and Mathematics, Spanish Language and Foreign Language (English), Social Sciences, History and Geography.

The proposal was planned by students of the 2nd year of the Primary Education Degree, with the intention of being implemented as a welcome and inclusion activity for new students entering the first year of the Early Childhood Education and Primary Education Degrees.

The main beneficiaries of this proposal are the new students at the Centro Universitario Sagrada Familia, as well as teachers and students of the different grades who intervene as collaborators, assuming some function necessary for its execution, or as players, accompanying the new first-year students, since the latter can only participate by playing.

Objectives of the Proposal

This didactic proposal intends that students obtain a significant learning of the contents worked on in the degree, increasing their active participation by bringing to reality the methodology of cooperative learning, since it is necessary the cooperation of all, project-based learning, service learning and students learn to learn by trial and error by exercising the work of monitors and coordinators.

Moreover, one of the most essential objectives expected after the implementation of this proposal is to achieve a climate of trust, empathy and respect of higher quality, so that students of all grades feel more integrated among themselves and in the institution, thus favoring coexistence among all the agents that are part of the school. It would also be ideal to observe in students in advanced courses an attitude in which motivation and initiative predominate, which are key to entrepreneurial competence.

From the point of view of the beneficiary students, belonging to the first year of the degree, the main objective is:

- To get to know the environment and spaces of the University Center, facilitating its social inclusion among new students and students of higher grades.

As secondary objectives, it is intended:

- Acquire soft skills such as teamwork, assumption of responsibilities, resistance to failure, leadership, problem solving and empathy.
- Acquire a positive and welcoming image of the University Center.

From the point of view of the student organizers and collaborating students, the main objective is:

- Acquire competencies specific to the Primary Education degree, highlighting those of entrepreneurship and learning to learn.

As secondary objectives, it is intended:

- Acquire organizational and planning skills.
- Acquire soft skills such as teamwork, assumption of responsibilities, resistance to failure, leadership, problem solving and empathy.
- Develop imagination and creative capacity.
- Acquire methodological resources applicable to teaching in schools.

The main expected objectives can be evaluated through the following rubric, in which we can observe evaluable criteria for both groups of students, first year beneficiaries and organizers/collaborators of higher courses, as well as for only one of them.

Methodology

Personal Agents Involved and Roles

For the implementation of the proposal, the following personal agents are required.

1. Consulting professors.

For the proper development of the project, being interdisciplinary, it is decided to take as advisors a professor of a subject of the degree related to any of the four areas of knowledge involved in the proposal.

Functions:

- Advise on the adaptation of the different tests to be developed in each of the four realms, associated to a specific area of knowledge, taking into account that these should be oriented to the undergraduates of the Primary Education degree.
 - Provide ideas for improvement.
 - Help in recruiting student collaborators.
 - Serve as a control element in case of disruptive situations.
 - Assists in the supervision of play areas (realms), depending on their specialty.
2. Proposal coordinators.

In addition to being the winning team of students in the ideas competition, they are the coordinators of the proposal.

Functions:

- Project design.
- Recruitment of collaborating students.
- Request for permits for the use of spaces and materials.
- Organization of spaces and materials.
- Purchase and distribution of materials.
- Publicizing the event.
- Creation of the player registration classroom.

- Organization of work groups, information on rules and game guidelines, distribution of functions and distribution of spaces and materials.
 - Supervision of the tasks and spaces on the day of the Project implementation.
3. Lords of the realm.

They are the coordinators of each of the four game zones.

Functions:

- Present the theme of the corresponding play area.
- Motivate the participation of participants.
- Control the time and flow of the game, together with the knights of the kingdom.

Character description: the lords are the highest authority of each realm or area of play; therefore, they should dress, look powerful and try to represent the area of knowledge associated with each realm. Thus, they will be characterized as follows:

- Lord of Communication: he has white hair and a long beard and wears a large light blue tunic with many golden details. In addition, he carries an old bandolier with numerous worn papyrus scrolls, a white cane similar in shape to a fountain pen and a laurel wreath.
- Lord of Wisdom: his hair and beard are short and dark brown. He wears a large white robe with gold details and carries various concoctions and potions tied to his belt, a braided wooden staff, which imitates the branch of a tree, with a large crystal at the top and a laurel wreath.
- Lady of Nature: her hair is red and she wears a large aqua green tunic with golden details. Along with this, she has a necklace with a compass rose, a pair of pocket watches tied to her belt, a golden braided wooden walking stick with a sun on the end and a small thin golden tiara.
- Lady of Sports: her hair is brown and she is dressed in a large red tunic with several golden details. Moreover, he carries a quiver and a bow on his back, a laurel wreath and a golden staff similar to a spear.

4. Knights of the realm.

They are the monitors of each of the tests that are organized in each game zone.

Functions:

- Explain to the participants the different tests performed in each realm.
- Control the time and development of the tests, together with the lords of the kingdom.

Character description: they are the protectors of the lords of the kingdoms and transmit an imposing and serious, but reliable aura. They wear silver armor with touches of gold, covering them from neck to toe. In addition, they carry a sword and a shield of a color similar to steel and with golden touches and, in the case of the shield, a distinctive logo of the faction they belong to: those who are from the kingdom of Nature carry a tree, those from the kingdom of Communication carry a feather, those from the kingdom of Wisdom carry a sun and those from the kingdom of Sports carry a quiver.

5. Accompanying travelers.

They are the monitors who accompany each group of players throughout the different game areas.

Functions:

- Guide the communities along the entire test route.
- Maintain a participatory and respectful environment among participants.
- Encourage and motivate participants.

Character description: they are the ancient adventurers who tried to find the treasure of Mount Olympus and know its intricate paths, but without succeeding; so they have decided to ally with each other and join forces with the communities to find it. Thus, they are wearing a brown tunic that reveals the hiking boots they wear, a large belt that holds it. In addition, they carry an old bandolier with water bottles and a schematic map of the area where the game takes place.

6. Guardian of Olympus.

Their job is to explain the game to the communities. This is the character who starts and ends the game, explaining the rules and guidelines to be followed.

Functions:

- Introduce the theme and main objective of the game.
- Award the results at the end of the activity.
- Describe the regulations and general operation of the Project to the participants.

Character description: the Guardian is an old man with a short green tunic, white hair and a large beard of the same color. In addition, he carries a wooden staff, similar to a twisted tree branch, a laurel wreath and a key ring with oversized keys attached to his belt. He must try to evoke a defiant personality towards the players, since, having guarded the four lost keys to the treasure, he will be the antagonist.

7. Communities.

They are the players. They are organized in groups, considered as a community. It includes new students, students from higher grades who want to participate as players and teachers, if they decide to participate.

Functions:

- Actively participate in the proposed activities and games.
- Follow the rules and organization of the Project.

Character description: players will not be themed in any special way, as they are considered human beings trying to find a hidden treasure on Mount Olympus.

Didactic Methodologies Applied to the Development of the Proposal

In the conception of the proposal, the implementation of active methodologies is used, since they can be considered as a paradigm for the construction of knowledge, oriented to cultivate in the student competencies such as autonomy, the development of collaborative work in small multidisciplinary teams, a participatory attitude, communication and cooperation skills, problem solving, creativity, among others. By virtue of their relevance and transcendence in the integral development of students, it is understood that they facilitate the effective achievement of the objectives that form the backbone of this proposal. The following methodologies are highlighted:

a) Project-based learning: it is used for the creation and development of the proposal. This method of learning promotes the apprehension of new knowledge, being considered an indispensable element for the achievement of significant learning, encouraging active learning, involving students in the creation of a final product that evidences the practical application of the acquired knowledge.

b) Cooperative Learning: This methodology, endowed with a remarkable educational potential, stimulates aspects such as interpersonal communication among peers, individual and collective responsibility, effective communication and teamwork. Consequently, its implementation within the framework of this proposal proves to be very useful for the achievement of these purposes, both for the group of participating students as well as for the group of organizing students.

c) Service Learning: This methodology is one of the entrepreneurship modalities that is closely linked to social and civic change; in fact, it is intrinsically related to ethical and community service competencies. In the context of this proposal, it is hoped that the student organizers will provide a valuable service to the rest of the student community, constituting a meaningful learning experience for both the organizers and the beneficiaries. This approach promotes the development of competencies in the organizers, who must plan, manage the activity and deliver the service effectively. On the other hand, the public receiving the service will benefit from the practical experience derived from it.

Description of the Final Product

Since the present article refers to a didactic proposal that has not been carried out, it is impossible to gather conclusive results. Likewise, Organic Law 3/2020, of December 29, which amends Organic Law 2/2006, of May 3, on Education (LOMLOE), establishes in its articles and in the associated curricular documents that didactic proposals must focus on learning situations that promote the development of key competencies in students. Although it is not explicitly specified, in order to adequately evaluate the development of competencies and learning, it is advisable that learning situations include a final product that evidences the student's achievements. This approach facilitates the observation and evaluation of the learning achieved and allows for effective feedback of the educational process.

According to the above, the proposed final product would be based on a rotating gymkhana, developed in four different spaces, each considered a realm. Each realm is related to a different area of knowledge, having to pass in each of them several tests, specific to the area of knowledge mentioned.

Each kingdom is assigned a Lord of the realm and as many Knights of the realm as there are tests.

The communities must attend each kingdom at the beginning, and there must be, at the beginning, the same number of communities in each kingdom.

The day begins in a classroom at the center, set up for the event, where a person in costume appears just as each community has settled in under the supervision of the accompanying Knights. This character represents the guardian of Olympus, who has arrived there to report the war that has just broken out between his four kingdoms and, very concerned, asks for the help of the communities to return Peace to Olympus. This will only be possible if some community manages to recover the key capable of unifying the kingdoms.

This will be awarded to the community that manages to pass all the tests that each kingdom imposes on them with the highest possible score.

After introducing the students to the dynamics and the theme, the communities are distributed among the different kingdoms, so that the same number of communities are playing in each kingdom for thirty minutes.

In each realm, there will be four different tests, related to the subject matter of the realm. Each community assigned to a kingdom, must start with a different test and try to score the maximum in each of them, rotating through all of them every 5 minutes. At the end of this time, the teams receive the scores from the Lord of the realm and rotate to the next corresponding realm, having to complete all rotations in two hours total time.

The kingdoms will be as follows:

- Realm of Communication (Spanish Language and Foreign Language)

Characters: in addition to the guardian of Olympus, four accompanying knights and two knights of the kingdom are needed, these must wear an identifier that they belong to this area, such as letters scattered throughout the costume.

Space required: floor of the building assigned to university students.

Quizzes: once the gymkhana is over, the teams participate in a storytelling activity. By drawing lots, each team receives three key elements: a subject, an action (verb) and the ending of a story. With these elements, together with the objects obtained in the gymkhana, participants have ten minutes to create and interpret a story. Creativity and story structure are critical to the final score. If the story is original, funny and well-structured, the team receives five additional points, thus encouraging oral expression and teamwork in a dynamic and educational environment.

Materials: the objects that will be distributed throughout the gymkhana and then the paper cut-outs with the different subjects, verbs and endings.

Duration: the first part of the activity will last twenty minutes and the second part will last ten minutes.

- Kingdom of Wisdom (Science and Mathematics)

Characters: Guardian of Olympus, four accompanying knights, and two knights of the kingdom, who must wear an identification that they belong to this area, there can be numbers scattered around the costume.

Space required: picnic areas and courtyard of the university center

Testing: this area will be divided into two parts. The first consists of a quiz on scientific experiments, designed to introduce participants to a learning situation useful for their future teaching work. Through this dynamic, teams test their scientific knowledge and skills in a practical and fun way. To do so, each group will be instructed one week in advance to find and prepare a science experiment at the elementary school level. Each group must carry it out and explain its meaning to the rest of the group.

Once the contest is over, different logic games are played until the time available is up. One of these challenges can be the classic wolf, sheep and lettuce problem. After solving it, they must mime the solution. This activity not only encourages logical reasoning, but also cooperation and corporal expression of the participants.

Materials: the teams are informed of this contest in advance, since on this day each team must bring the necessary material for their respective experiment. In addition, the cards with the different logic games will be needed.

Duration: the contest will last 20 minutes (between preparation and presentation) and the second part will last 10 minutes.

- Kingdom of Nature (Social Studies, Geography and History)

Characters: Also to be taken into account are the eight historical characters belonging to the second test.

Space required: several courts located in SAFA's facilities.

Testing: three different activities are carried out in this area. The first activity consists of finding and correctly locating on a map of the world various geographical elements, such as capitals, emblematic monuments and rivers, which are represented by hidden images in different areas. Participants must race and collaborate cooperatively to locate the most illustrations in a short period of time, and at the end, each team receives a score based on the accuracy of their hits. The competition then continues with a challenge involving eight monitors,

each dressed as a historical figure, in which players must search for hidden cards containing stories and information about these figures. The objective is to correctly match each card with its respective character and then locate the corresponding monitor to hand them the envelope. The team that manages to associate the most cards gets an extra score. The final activity is an interactive dynamic of cultural and historical questions, in which each correct answer adds a point, making the information gathered during the previous activities become the basis for this final challenge. This comprehensive proposal encourages teamwork, mental speed and interest in cultural and historical heritage, combining learning with the thrill of competition in an enriching experience for all participants.

Materials: world map and graphic elements (capitals, monuments and rivers), envelopes and cards, and finally the cards with the questions.

Duration: the first activity lasts a maximum of 10 minutes, the second 20 minutes and the third 10 minutes.

- Kingdom of Sport (Physical Education)

Characters: four accompanying knights and two knights of the kingdom, who must wear an identifier on their costume that indicates that they belong to this area, such as balls.

Space required: pavilion or gymnasium of the university center.

Tests: the games in this area are played in a space that is divided into four zones. In each zone there is an activity, a monitor and a team to achieve the highest possible score in five minutes and, at the end of this time, the teams rotate to the next game zone that corresponds to them. The first game involves transporting balls from one wall to another by means of ski boards, for which great team coordination is required; the second involves transporting the maximum number of bricks, forming a tower with them, on pikes; the third involves knocking down as many plastic bottles as possible by means of a tennis ball and the fourth involves moving balls as a team through a support formed by plastic cubes.

Materials: balls and ski boards, bricks and spades, plastic bottles and tennis balls and finally plastic buckets.

Duration: a total of 20-25 minutes.

Once all the teams have played in all the realms, all the communities gather in a place of the institution, accompanied by the accompanying Knights to perform the closing of the day and announce the winning team through the Guardian of Olympus.

As for the rotation of the gymkhana, a characteristic element of the gymkhana, it will be executed every half hour as follows: the teams that have played the games in the Kingdom of Communication move to the Kingdom of Wisdom, those who were in the latter move to the Kingdom of Nature, the participants who were in this kingdom move to the Kingdom of Sport and those who have just played in this kingdom rotate to the Kingdom of Communication. Also, the captain of each group of players has a map of the center in which the different game zones are identified and the routes they must follow to move to them are marked, as well as the order of the kingdoms that correspond to their participation.

The duration of the activity will be approximately 160 minutes:

- 20 minutes for the presentation and explanation of the day.
- 120 minutes total time of games played in the different areas
- 20 minutes of dynamic closing.

Consequently, it would be convenient to start the day at eleven o'clock in the morning, since, afterwards, it may be ideal to start a small gathering in some space of the

center enabled to share a small snack among all, both students and teachers, with each group providing a plate of food and a couple of drinks.

Finally, if this experience is successfully passed, it can be transferred to an elementary school. In this way, through an agreement between the institution and a school, university students can put their learning into practice, adapting games from different areas to the ages of each primary school cycle. In this case, the children take on the role of players, and the future teachers act as coordinators or monitors.

Organizational Constraints

As for the organization of the project, several factors must be taken into account. On the one hand, it would be advisable to consider the most appropriate date ~~would be the~~ at the end of October, since by then all the students have already entered the University and, therefore, it is the ideal time to welcome new students with a special dynamic, without interrupting the exam calendar and avoiding the anxiety that the end of each term entails for them.

On the other hand, in order to make the project better known and, therefore, increase the participation of students and faculty members in it, it is appropriate to carry out some promotional actions in the university center. Thus, the center's social networks and a messaging application, if used, can be used to share eye-catching elements, such as infographics or posters, and information related to the organization and development of the project. On the other hand, informative posters can also be placed in the busiest areas of the center, such as the cafeteria, the main hallway or the access door to the center, or daily or weekly reminders can be made through the radio station available to the center, again, if available. Finally, and perhaps most importantly, at least one informative talk should be given to university students who are eligible to participate, as this will be the most effective means of raising awareness.

A Google form will be enabled for student registration, so that all contact information with participants is collected.

An evaluation form will also be made available to assess the suitability of the activity once it has been completed.

Phases of the Proposal

1. Creation Phase

First of all, those responsible for the project must publicize the conference through advertising and information. To do this, you can use the different media available in the university center: telegram, classroom and university radio. In addition, it is ideal to place informative posters on the walls of the center, as well as for those responsible to offer informative talks to all the courses of the degree, which will take place in each of the classrooms during school hours; therefore, those responsible should ask the faculty for permission to dedicate ten minutes of the time allotted to the teachers for teaching their subjects to explain the lectures. The objective of informing all members of the center about the project is to recruit students and teachers to act as coordinators, organizers and monitors in the days or, on the other hand, to participate as players. This recruitment will be registered through a google questionnaire, in which each person has to enter their personal data, the course and grade to which they belong, their institutional email and the role they wish to participate in. Once the registration period is closed, those in charge are in charge of organizing the players into teams, complying with the requirement that each team be made up of students from different grades, as well as contacting those who offer to be coordinators and monitors, grouping them into

work groups by areas. After the selection, the list of the teams, both players and organizers, coordinators and monitors, will be published in the various media of the university center and, of course, at all times the institutional mail of those responsible for the project must be provided to all members belonging to the university, so that everyone can contact them to consult any questions or problems that arise in relation to the conference.

2. Programming Phase

Once all the participants have been organized into teams of players or coordinators and monitors, three meetings must be held to design and develop the project. The first meeting is oriented to the review of the games suggested by area, always with accessibility to improvement proposals. Also, it will be verified that the itinerary of the gymkhana is correct, as well as that the number of activities and the spaces provided for them are appropriate to the number of registered teams of players and, finally, each working group, formed by coordinators and monitors according to area, will make a list of materials and costumes necessary for the development of the games related to the theme of the project and their subjects of knowledge.

As for the second meeting, the persons in charge are responsible for bringing to the second meeting all the materials included in the lists obtained from the first meeting, which are distinguished between borrowed materials, purchased materials, and recycled materials. Obviously, borrowed materials, such as costumes, and recycled materials, such as cardboard boxes, will be provided by all coordinators and monitors; however, purchased materials are brought only by those in charge, whose expense is associated with the university center management. During this meeting, with all the materials present, all the games will be created with their corresponding decoration.

Finally, the third meeting is dedicated to specifying the roles to be played and the steps to be followed during the day of the conference. In addition, a rehearsal of the Gymkhana will take place, starting with the introduction of the theme with the guardian of Olympus explaining the war between the kingdoms and how to achieve Peace, then going through the entire itinerary of the rotating Gymkhana, setting up the materials in each game zone and briefly reviewing each activity and, finally, reviewing the installation where the winning team will be celebrated and the closing of the event will take place. Moreover, it is also necessary to decide where to go during the day in case of any unforeseen event, accident or inconvenience during the activity.

3. Implementation Phase

On the day of the conference, all the people involved as coordinators and monitors must arrive at the university center two hours before the start of the activity. During this time, they must dress up, put on make-up, set up the decorations and materials for the games in each area according to the kingdoms and, finally, briefly remember the roles, organization, itinerary, emergency space and design of the Gymkhana. In this way, when it is time to start the day, all monitors and coordinators must be ready at their posts with all the information clarified, while those responsible for the project together with the accompanying Knights will pick up the different communities, teams of players, to move them to the game area where the Guardian of Olympus will later appear. The communities will always be under the supervision of the Knights, who will guide them throughout the process. If at any time there is any doubt, incident or accident, the Knights will direct their team to the emergency area to contact those responsible for the project and, thus, incorporate the best possible solution.

Once all the communities have rotated through the different kingdoms and arrived at the place of the closing of the event, it will be verified which of them has

managed to restore Peace, the prize obtained will be announced and, afterwards, the aperitif shared among all the participants of the days will begin, thus strengthening the coexistence among them.

4. Evaluation Phase

As it is recommended after each day, conference, event... Participants should be asked for their opinion in order to improve the design of the project for its next implementation in subsequent courses. Therefore, a google form will be published both in telegram and in classroom in which, anonymously, students and teachers will evaluate some questions such as, for example, the time spent on the day, the organization of it, aspects to improve, if the theme has been attractive or not... These data will be collected in a document, as they will be used for the development of future events.

Conclusions

The impact of this proposal is broad and beneficial to all involved. A study of the expected objectives could be considered that the implementation of the event would reaffirm the ability to create meaningful learning experiences and boost their motivation, while on the other hand, it contributes to make the institution that accepts to carry it out more visible, highlighting its differential values and strengthening its attractiveness for future students.

Moreover, by bringing together all grade levels and different learning areas in the realization of the same experience through cooperation, coexistence between the students themselves and the teachers and students is fostered, promoting an environment of collaboration and mutual learning.

In other words, the incoming students enjoy and develop relationships among themselves that are fundamental for their academic future, while the rest of the university students acquire practical experience in educational innovation, strengthen their teaching attitude and create affective bonds both among themselves and with the center's staff. This generates a climate of trust and respect, allowing the students to perceive the institution as a true space for training and growth. Teachers, in turn, strengthen their relationship with students outside the classroom, significantly affecting their understanding of students' future needs and their ability to receive more personalized guidance.

Limitations

As the project is an undeveloped proposal, it is impossible to generate a discussion about it, since there are no evidenced results. This is a didactic proposal and not a research study. Nevertheless, it is considered that the proposed objectives are really achievable in the case of implementing the proposal in the institution, although it is true that the success of each of its evaluable criteria cannot be guaranteed since it has not been previously tested.

The proposal requires a high degree of responsibility and dedication, since its implementation depends on the voluntary participation of students and teachers willing to spend much of their free time planning activities, preparing materials, organizing spaces and dissemination. The lack of commitment of any member may generate imbalances in the organization and require more preparation time outside of school hours. In addition to this, there is the economic effort involved for the institution, even though efforts are made to reduce costs through the use of borrowed or recycled materials. Another difficulty is the complex coordination among numerous participants, since they all depend on each other and require clear and updated information.

Otherwise, cooperation is affected and misunderstandings may occur, compromising the success of the day.

By involving the entire university center, the day interrupts the school schedule, which may affect the academic schedule if the teaching team is not notified sufficiently in advance. In addition, their organization requires exhaustive planning and the holding of multiple meetings beforehand, which could take up breaks or time slots dedicated to the participants' other academic activities. Therefore, the coordination of schedules between monitors and volunteers can be complex and may even cause difficulties in attending some classes.

Another important challenge is to recruit a sufficient number of volunteers to ensure the smooth running of the day. The availability and commitment of the students are key factors for the success of the proposal. However, if effectively organized, the activity represents an exceptional and unrepeatable opportunity for learning and growth, both for students and teachers, as well as for the educational community as a whole.

In the case of transferring the project to a school, it is necessary to establish agreements between the university and the school, establishing civil liability insurance and full security guarantees for the execution of the project.

Prospective

If the implementation of this workshop is successful, it can be carried out in a primary school as a continuity proposal in a similar way to the one presented. To this end, the activities of the gymkhana can be adapted to the level of each of the cycles of Primary Education and, this time, all the university students would take on the role of teachers while the teams of players are formed by the students of the school. If this were achieved, it would guarantee the development of real and meaningful practices that would integrate the competencies, concepts and contents of the Primary Education curriculum.

It can also be implemented in other educational environments such as summer camps or sports schools.

Finally, one of the strengths of the proposal is its thematic flexibility, which allows the activity to be adapted to different areas of knowledge. This versatility not only enriches learning, but also offers the opportunity to work on any area, competence or skill according to the interests and needs of the participants.

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**PREVENTION AND MANAGEMENT OF STRESS AND ANXIETY LEVELS IN EMPLOYEES
WORKING REMOTELY**

**PREVENCIÓN Y ATENCIÓN DE LOS NIVELES DE ESTRÉS Y ANSIEDAD EN
COLABORADORES QUE LABORAN EN MODALIDAD DE TRABAJO REMOTO**

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ABSTRACT

Keywords:

work stress, prevention, care,
anxiety, remote work.

Reports of increased employee absences have raised concerns in the workplace, as they could be linked to physical ailments indicative of underlying stress and anxiety management. However, to date, these absences have not been systematically documented or thoroughly investigated, representing a gap in current knowledge about employee health and well-being in the workplace. Therefore, the objective of this research was to design and validate a prevention and care program to reduce stress and anxiety levels in employees working remotely. The research used a quantitative approach and a non-experimental design. A sample of 70 employees was used to complete a sociodemographic questionnaire, a Perceived Stress Scale (EEP-10) questionnaire, and the Hamilton Anxiety Scale. It was found that, based on an analysis using the statistical program for social sciences SPSS 24©, to maintain or improve work stress levels, in addition to the intervention program, it is recommended to prevent work overload and evaluate employee capabilities. In addition, coping strategies and styles should be implemented, as well as healthy lifestyle habits. At this stage, it is important to establish a work schedule and do everything possible to adhere to it. The thesis reveals that, although employees working remotely exhibit skills to manage their problems, they also face high levels of anxiety and stress. The proposed prevention and care program, called Ataraxia, seeks to address these difficulties, being validated by experts, with the aim of improving emotional well-being and quality of work life.

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RESUMEN

Palabras clave:

estrés laboral, prevención,
atención, ansiedad, trabajo remoto.

Los reportes de incrementos en las ausencias de los trabajadores han generado inquietudes en el entorno laboral, ya que podría estar vinculado a malestares físicos indicativos del manejo subyacente de estrés y ansiedad. Aun así, hasta el momento no se han documentado de manera sistemática estas ausencias ni se ha investigado en profundidad,

lo cual representa una brecha en el conocimiento actual sobre salud y bienestar de colaboradores en el entorno laboral. En tal sentido, el objetivo de la presente investigación fue diseñar y validar un programa de prevención y atención para la reducción de los niveles de estrés y ansiedad en colaboradores que laboran en modalidad de trabajo remoto. La investigación tuvo un enfoque cuantitativo y de diseño no experimental. Para ello, se trabajó con una muestra de 70 colaboradores, a quienes se les aplicó un cuestionario de caracterización sociodemográfica, un cuestionario de Escala de estrés percibido (EEP-10), así como la escala de ansiedad de Hamilton. Se encontró que, a partir de un análisis a través del programa estadístico para ciencias sociales SPSS 24©, para mantener o mejorar los niveles de estrés laboral, además del programa de intervención, se recomienda prevenir la sobrecarga de trabajo y evaluar las capacidades de los empleados. Además, implementar estrategias y estilos de afrontamiento; así como hábitos de vida saludable. En esta etapa es importante establecer un cronograma de trabajo y hacer todo lo posible para cumplirlo. La tesis revela que, aunque los colaboradores en modalidad de trabajo remoto exhiben habilidades para manejar sus problemas, también enfrentan altos niveles de ansiedad y estrés. El programa de prevención y atención propuesto denominado Ataraxia, busca abordar estas dificultades, validándose a través de expertos, con el objetivo de mejorar el bienestar emocional y la calidad de vida laboral.

Introduction

Today, many technological and social advances have exposed social problems. Workspaces, like employees, are no strangers to this situation. Recent research around the world has shown that generational transitions occur differently as personalities change, depending on historical context, family structure, social development and economic growth, along with many other factors.

Globalization has brought about many changes in approach as supply chains become more complex, thus changing the employment landscape. The evolution of industries has optimized equipment uptime, delivery time, transportation time and raw material handling, leading to longer working hours, more jobs for workers and exploiting them while doing what they can on their own. are not prepared and are obliged to complete them as soon as possible.

All these changes are observed only during the production process, but most of these studies do not consider their impact on the organization's employees while they perform their work, generating physical, mental and behavioral health problems that affect organizations and society; governing the family, the community and the State.

An extraordinary and at the same time challenging aspect at the time of doing studies and research related to the human being, is that each individual possesses unique and unrepeatable characteristics. Although over time we have gained a clearer understanding of how the human mind works, there is always a factor of individuality that must be taken into account. That said, it is common knowledge that some people are more prone than others to suffer from anxiety and/or stress, which represents a threat to the individual's emotional stability, personal growth and the quality of interpersonal relationships.

In this case we worked on the scenario of remote work, considering the specific context in which the individual is exposed, this modality, although already present to a lesser extent several decades ago; as a result of the pandemic by COVID-19 declared in 2020, the adoption of this methodology increased significantly around the world, thus becoming a common practice and even necessary for many companies. At this point, almost five years later, it is no longer considered an emergency measure, but a new normality that is here to stay. Although it has brought benefits for the organization and the employees as individuals, there are also other aspects to take into account, such as, for example, the absence of human contact that prevents us from perceiving the emotional state of those with whom we work on a daily basis.

This is why many organizations in different areas and industries have adapted a new work modality for which they initially did not have the tools, systems or methodologies to perform successfully (Becerra, 2021). In this sense, a reasonable amount of time has passed in which the employees have adapted and the systems have been updated; however, the physical distance remains and the emotional well-being of each employee cannot be assured at a glance. This study is mainly based on fostering interest in promoting prevention and attention to mental health care and quality of life of all those who have had to adopt remote work in the organization, through the design and validation of the contents of a program to prevent and address the high levels of stress and anxiety presented in many of the collaborators, considering a previous diagnosis for the same.

During pandemic and post-pandemic times, humans have experienced feelings similar to those of chronically ill older adults. Taking as a reference the results of a study by Ortiz, R. E., Forero, Q. L. F., Arana, C. L. V. and Polanco, V. M. (2021), who state that "older adults with chronic illness show lower levels of resilience, optimism, hope and life purpose, ... The above, allows us to understand that the condition of illness affects the psychological resources of the person, understood ... as resilience, optimism, hope and life purpose, which in turn function as protective factors of mental health in the processes of illness, in which the opportunity to strengthen or reinforce through the establishment of intervention programs is visualized".

It is also considered important that, according to Sierra, Rodríguez, Vargas and Fuentes (2022), “during the COVID-19 pandemic, the global working population presented excessive work overload due to the increase in responsibilities to be performed, the lack of compliance with disconnection schedules and the imbalance in relation to routine family activities, developed in the same schedules, generating a perception of high levels of work stress” (p. 145).

This is in line with Cuellar, Gallegos, Arias and Morey (2025) who point out that “the uncertainty due to the global health context, together with taking work responsibilities from the physical environment of the company to the home, led to a blurred separation between the personal/family life and the professional life of the collaborator, increasing in many occasions the overload of tasks, thus affecting work performance” (p. 26).

In Mexico, for example, according to studies by Hernandez (2023), “At least four out of five workers in the country have experienced high levels of work stress in the last year; only a quarter have received support from their company. Covid-19 had a significant impact on people's emotional well-being” (p. 01).

Seen from this perspective, when the human being begins the process of adaptation in the face of changes that are usually unexpected, it is common that different areas of the individual's life are affected (Papalia, 2017). All fluctuating emotions are especially affected and influenced, considering that every day individuals face situations and must make decisions that affect all areas of their lives as a result. One area that has a great influence on a person's wellbeing is work, since most of the day is dedicated to it. For this reason, it is essential to prioritize mental health as much as we prioritize the physical health of individuals.

On this occasion, we worked with the group of employees who specifically maintain a remote work modality; this is due to the fact that the organization keeps more than half of the employees working full-time on-site, which has caused interpersonal disconnection and lack of knowledge of the emotional state of the employees who are remote due to lack of contact. Although its work is successful, the company is interested in knowing the true level of quality of life for everyone and taking the pertinent measures within its competence.

The organization under study is a company in the banking sector where the entire research process was carried out. Since the beginning of 2020, management notes that the leaders of each team have verbally and unofficially expressed different moods and emotions about the adoption of virtual work by their teams. Some say that remote work has led to higher productivity and others say that their team has significantly decreased the amount of work done during the week, they say that their team is more relaxed in their coexistence, while others are working late into the night.

The reports made do not have measurable data, because they have been established based on information provided verbally based on observation, as well as evidence of reports and concerns provided by supervisors that indicate the decrease in deliveries and productivity.

The observation and reporting of increases in intermittent absences throughout the day among coworkers generate in the work environment, as it could be linked to physical ailments that, in turn, could be indicative of underlying stress and anxiety management in each individual. Despite the relevance of this situation, it is necessary to point out that so far these intermittent absences have not been systematically documented and their possible relationship with employee stress and anxiety levels has not been investigated in depth. It has not been possible to document or investigate because, since we are working remotely, we do not have complete control of the work time invested by each employee.

This lack of comprehensive documentation and understanding represents a gap in current knowledge about the health and well-being of employees in the work environment. The absence of detailed records of these interruptions and their possible connection to psychological and emotional factors limits the ability to effectively address the challenges employees face in terms of health and productivity.

By identifying the frequency and intensity of stress and anxiety-related symptoms, it will be possible to design appropriate interventions and support strategies that address both the physical health challenges and the emotional and psychological factors that may be contributing to these absences. By adequately understanding the reason for intermittent absences during the day of employees in relation to their physical and emotional well-being, as well as documenting and analyzing this situation, it is expected not only to fill a gap in knowledge, but also to provide a solid basis for the design of measures to prevent and address stress and anxiety, which promote the overall health of employees and improve their quality of life in the work environment.

In this regard, Sucapuca (2022), comments that emotional stability facilitates the performance of functions, thus considering that he refers to such stability as low levels of unpleasant sensations. This time the focus is on emotional states, anxiety levels and stress.

The new scenarios produced by the pandemic caused high occupational stress in both employed and unemployed people. Interpersonal relationships between supervisors, subordinates and coworkers in general were also affected; conversations related to daily life issues or activities to which free time is dedicated were lost due to the level of interaction allowed during the state of emergency (Espinosa, 2021).

It is important to highlight that in the company under study, through the diagnosis made by the researcher, some signs of work stress present in the collaborators, such as: physical and mental discomfort, demotivation and anxiety; all this generates as a consequence situations of absenteeism and therefore a low performance in the workplace.

In this sense, Rodríguez (2021), comments in his research conducted in Panama that with the arrival of the pandemic it is deduced that the future causes of occupational stress would be unemployment, isolation and the self-demands of people to achieve goals quickly. Prolonged confinement brought consequences to the health, work management and social environment of the individual. Because of their limited ability to go out, they were unable to engage in physical activities, they were not in contact with their social environment and, most importantly, many of these people stopped working for fear of becoming infected or because they became unemployed. There are characteristics that proved to be a source of anxiety such as not doing anything, not having a job, or thinking about the possibility of a decrease in salary (Montoya, 2021).

In 2019, the organization under study conducted a series of surveys among its employee population to assess their emotional concerns and discomforts. The results revealed higher levels of stress and anxiety than initially anticipated. In response to these findings, the company decided to increase the hybrid work model, which combines remote and face-to-face work, with the aim of reducing stress and anxiety levels. However, with the arrival of the pandemic and an increase in the number of collaborators, the company was forced to adapt to full-time remote work in all its areas, without being able to comprehensively monitor the results of this new way of working in terms of reduced levels of stress and anxiety.

These results highlight the need for further research and follow-up on the impact of full-time remote work on the emotional health and well-being of employees in the organization under study. They also suggest the importance of implementing additional strategies to address the high levels of stress and anxiety experienced by employees during this period, in order to promote a healthy and sustainable work environment.

Given that the transition to full-time remote work may have generated significant changes in the work environment and work dynamics, it is essential to understand how this new modality has affected the emotional health of employees, in order to provide practical tools to address it.

The pandemic forced many organizations to change their way of working, involving the adoption of digital tools and remote methodologies as their main strategies to keep a business

afloat. While some organizations had made small previous advances in digital transformation and were able to adapt more easily, others that considered digital transformation as something far away at the time had to adapt in a short time to meet all the challenges presented during the healthcare crisis (Montoya, 2021).

Chuco (2021), points out that the world situation due to the pandemic had a notable influence on various areas of the individual's life, such as the emotional, social and work areas. Some people lost their jobs, others were overwhelmed with work as their functions increased but not their salaries; others managed to keep their jobs, but had to adapt to the many changes in the work methods brought about by this situation. The author also indicates that work stress results from an imbalance between the demands of the job and the person's own ability to cope with them. The importance of prioritizing the emotions and situations that people experience as a result of the changes and that could lead to an imbalance in their work performance is emphasized.

Likewise, Jamil (2023) in his research entitled "Exploring the Link Between Job Stress and Performance: Identifying the Root Causes," posits that there are profound consequences that work challenges have on job performance. These challenges significantly impact employee experiences and overall organizational effectiveness, from higher absenteeism to lower job satisfaction. Addressing these challenges is crucial to fostering a positive work environment that promotes employee well-being, productivity and long-term commitment to the organization.

Arteaga (2020), with the study called "Stress in health workers during the implementation of teleworking in the midst of the pandemic COVID-19, at SEK International University", had the objective of identifying stress in health collaborators evidenced by remote actions and related to the pandemic by COVID-19. It developed a descriptive research study of cross-sectional type and had a population of 45 collaborators of the health sector located in the category of telework. It used a work stress survey instrument to assess psychosocial causes and consequences. As a conclusion, it determined that there is a high threat of stress in female groups of the evaluated sector, which is increased by the lack of a good and clear implementation and description of the requests that are required in order to perform the assigned work. This reflects inconveniences that cause health difficulties in employees and increase the psychosocial danger.

The research referred to "Remote work in times of covid-19 and its impact on the worker" focused the main objective on understanding how a group of workers in the city of Bogota, interpret and face the interaction that occurs between work and family life in the scenario of remote work during times of COVID-19 (Cortes, 2020)

This study was based on a qualitative approach, in which 6 workers were interviewed, who work remotely, due to the health emergency caused by the pandemic. The main results comprise a set of tensions, which emerged because household activities or family time interfere with work demands; this resulted in the working day being affected, interrupted or extended in time and space. Therefore, they must attend to domestic chores, such as caring for the care and learning of children (Cortes, 2020). To reduce such tensions, the implementation of strategies to reduce conflicting relationships between family life and work life was proposed; for example, support with an external figure called a domestic employee, the distribution of activities and routines with responsibilities for household members to facilitate daily life; in addition to the establishment of schedules, which allow separating work spaces and dedicating them to family spaces (Cortes, 2020).

Based on the above, the main objective of this research was to design and validate the content of a prevention and care program for the management of stress and anxiety levels of the company's employees who work remotely.

Method

Design: The research was conducted under a quantitative approach considering the results of the tests applied, based on a deductive and logical scheme to formulate research questions and hypotheses to subsequently test them. We worked under a non-experimental, cross-sectional research design. It is non-experimental, because the study variables were not manipulated, and cross-sectional, because the research was carried out in a specific time period. The scope of the study is descriptive, since information was collected and measured independently on the variables studied (Hernández Sampieri R. F., 2018).

Participants: For the design and validation of the prevention and care program for the reduction of stress and anxiety levels of the company's employees, on the one hand, a universe of 190 Towerbank employees was used, of which 85 work remotely, so a sample of seventy (n=70) volunteers was selected by means of a non-probabilistic purposive sampling. This sample provided information to carry out the identification of needs captured from the results obtained in the questionnaires/tests measuring stress and anxiety (Hamilton Anxiety Scale and Perceived Stress Scale).

Instruments: First of all, the sociodemographic characterization questionnaire was applied to the employees, which made it possible to gather important information about the target audience. Next, the Perceived Stress Scale (PSS-10) was applied. This scale assesses levels of perceived psychological stress; that is, the extent to which situations in daily life are perceived as stressful. The scale includes a series of direct queries that explore the level of stress experienced during the last month. And finally, the Hamilton Anxiety Rating Scale, a psychological questionnaire used by physicians to rate the severity of a patient's anxiety. It consists of 14 items designed to identify the frequency and intensity of a patient's anxiety symptoms.

Procedures: In this research, three moments were considered: the construction of the object of study, the research design and the presentation of results. The instruments used in data collection were mainly closed-ended questionnaires and standardized tests, such as the Hamilton Anxiety Scale and the Perceived Stress Scale.

In this first stage, the consultation was carried out to identify the study group for the research, then proceeded to make a survey of the state of the art after the collection of sources and documentary review, then the information was analyzed and classified, which allowed determining the theoretical references applicable to it (Hernández Sampieri R. F., 2018).

In relation to the research design, information was collected in the organization under study from its employees. Finally, the results were presented in tables and graphs for analysis. The methodological development was based on the quantitative research paradigm, from which the techniques were defined for the collection of information and to respond to the proposed objectives.

For the presentation of the results, the selection, elaboration, validation and reliability of the measurement instruments were carried out and the variables were evaluated to obtain updated documentation on the research topic. The instruments were then answered and statistics were generated, which facilitated the analysis and interpretation of the data obtained. Once this was done, the final document and conclusions, including the program, were drafted and presented.

This program was proposed and validated in its content, using a specific validation format presented and approved by expert judgment. To ensure that the Ataraxia Prevention and Care Program to reduce stress and anxiety levels was relevant, effective and met the needs of the target audience.

Data and information analysis: Once the instrument was applied to the selected sample, the data were grouped in statistical tables, using descriptive statistics and percentage

analysis, where the results were presented based on average totals for each of the questions in the questionnaire.

Results

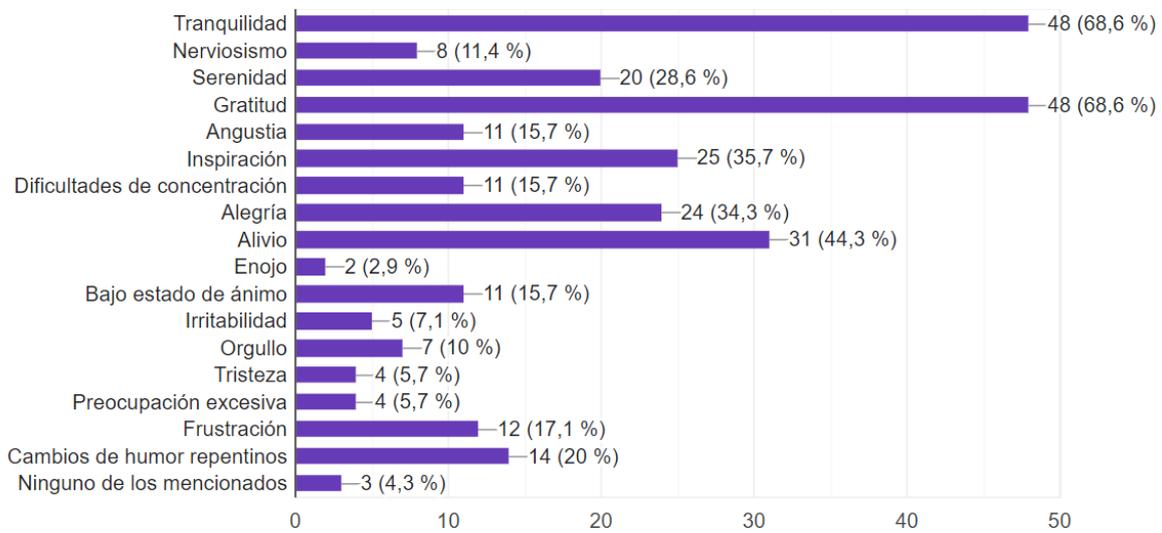
This section presents the results obtained during the process of applying the data collection instruments, with the purpose of diagnosing the situation of the collaborators and generating the theoretical categories on which the prevention and attention program to reduce the levels of stress and anxiety of the collaborators who work in remote work mode is based.

Once the diagnosis of the situation of the collaborators in terms of demographic and labor aspects had been made, the levels of stress and anxiety were determined according to the scales selected. Seventy percent of the sample is female, the highest age range (41.4%) is between 26 and 35 years old, and more than 60% of the respondents have been with the company for more than 4 years. Also, the majority of the sample is single. 98.6% do not have an official clinical psychological or psychiatric diagnosis. Sixty percent work in the remote work mode.

Regarding the emotional and physical state, there are 20 % who have perceived sudden mood changes, 17.1% frustration, 15, 7% low mood, 15.7% concentration difficulties, 15.7% anguish, 11.4% nervousness, 7.1% irritability, 5.7% sadness, 5.7% excessive worry, 2.9% anger. In addition, 48.6% have experienced back or neck pain, 24.3% sleep difficulties, 21.4% headaches, 15.7% lack of energy, 10% body aches, 5.7% increased heart rate, 4.3% diarrhea or constipation, 1.4% stomach discomfort, as seen in the following figures 1 and 2:

Figure 1

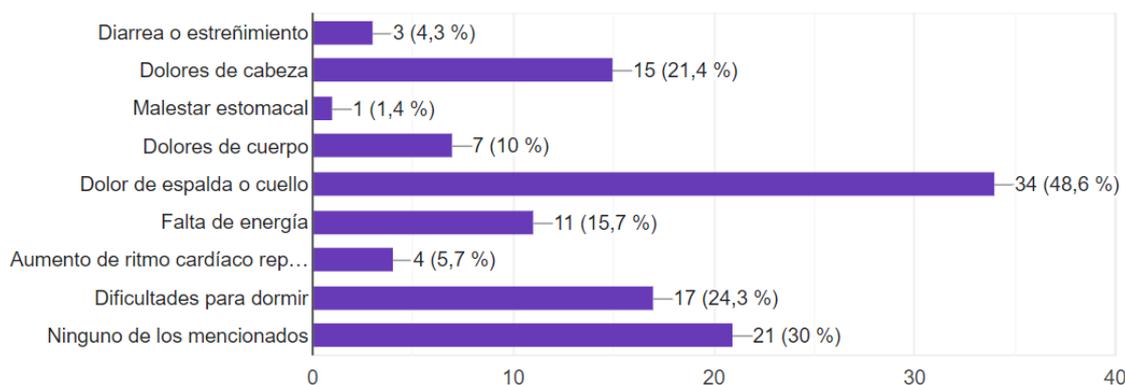
Employee data (emotional states)



Source: Own elaboration (2024)

Figure 1

Contributor data (physical sensations)



Source: Own elaboration (2024)

Also, continuing with the results of the Anxiety and Stress Tests, the sample responded that less than 50% said they were confident in handling their personal problems. About 40% said that from time to time they could not cope with all the things they had to do. Only 55% of the sample responded that they often control the difficulties in their lives. 4% reported an anxious mood. 100% of those surveyed stated that they had a feeling of tension, fatigue, inability to relax, startled reactions, easy crying, trembling, and a feeling of restlessness. Seventy percent of the sample reported suffering from mild to severe insomnia. Sixty percent indicate that they show signs of depression and 70% responded that they present physical symptoms (muscle aches and pains, muscle stiffness, muscle contractions, teeth grinding, trembling voice). While 50% respond that they show sensory symptoms (ringing in the ears, blurred vision, hot flushes, chills, sensation of weakness, tingling in the extremities). And 30% reported reflecting cardiovascular symptoms (tachycardia, palpitations, chest pain, pronounced heartbeat, fainting sensation).

The main result of this research was the generation and validation of the Ataraxia Program for prevention and attention to reduce the stress and anxiety levels of employees. To this end, the main findings of this study were taken into account in order to work directly on the aspects that have the greatest influence on both variables and thus offer better working conditions to employees.

In this sense, the theoretical categories were selected for the elaboration of the prevention and care program to reduce the level of stress and anxiety; this program is called "Ataraxia". The categories included for this event were oriented to identify or know the ideas and perceptions of the collaborators in relation to work stress and to define what work stress consists of in order to generate in the collaborators the need for change; definition of stress, the causes that originate it, symptoms, stages; thus, session I was planned, called: identifying emotions, thoughts and physical sensations.

It is important to note that in this same diagnosis it was detected that employees experience physical sensations such as: back or neck pain, sleeping difficulties, headaches, lack of energy, body aches, increased heart rate, diarrhea or constipation, stomach discomfort; all of which have an impact on work stress levels.

In that sense, session II was planned, identified as: Identifying emotions and modifying negative thoughts, with the purpose of making known what emotions are, what they are for, which ones trigger work stress in the collaborators; as well as putting into practice the training using the cognitive restructuring technique for the management of emotions.

In such a way that theoretical categories were identified, such as: happiness, anger, fear, sadness, surprise and disgust, types of thinking, cognitive distortions, types of distortions; which served as orientation to guide the Ataraxia Program.

Another important finding is related to events that occur unexpectedly; because the collaborators have felt nervous or stressed, they have a state of mind with worries, anticipation of the worst, apprehension, fearful anticipation, irritability, a feeling of tension, fatigue, inability to relax, startle reactions, easy crying, trembling, a feeling of restlessness; produced by tension; they have fears of darkness, loneliness, animals, traffic and crowds, difficulty falling asleep, interrupted or unsatisfactory sleep, tiredness upon awakening, difficulty concentrating and poor memory. These theoretical categories are included in the Ataraxia Program; through session III which includes training in relaxation techniques.

These theoretical categories made it possible to carry out the objective referred to the development and validation of a prevention and care program for the reduction of stress and anxiety levels of employees working remotely.

Discussion and Conclusions

When comparing the research findings with other doctoral studies in the field of stress management and health promotion, remarkable similarities and differences can be identified. For example, previous research, such as Olivares' doctoral thesis (2021), reported that remote workers also experienced benefits such as flexibility and better work-life balance. However, this study also found that remote work can intensify feelings of isolation, which may contribute to increased levels of anxiety. In contrast, the employees of the organization under study reported having adequate private space and access to technology that allows them to work without interruptions, suggesting a mitigation of some of the stressors identified in other studies.

On the other hand, Rengel's (2023) research on work stress in hybrid environments notes that mood swings and difficulty concentrating are common symptoms among employees. In this sense, the company's results corroborate this statement, as employees also reported frustration and concentration difficulties. However, while Martinez emphasizes the negative impact of the work environment on mental health, the participants in this research showed a remarkable ability to manage their personal problems, suggesting a resilience that could be further explored in future research.

In addition, it is relevant to mention that other studies, such as Perez (2019), have pointed out that physical manifestations of stress, such as muscle aches and sleep disorders, are common among remote workers. In this research, similar physical symptoms were observed, which reinforces the idea that stress can manifest itself in both emotional and physical aspects. However, the company's employees also expressed a positive perception of their ability to control the difficulties in their lives, which contrasts with Perez's findings, where a generalized sense of helplessness in the face of work circumstances was reported.

In terms of the perception of the work environment, Olivares' (2021) doctoral thesis highlights the importance of social support and effective communication in stress reduction. The results obtained in the company suggest that, despite the difficulties experienced, employees seem to have an environment that allows them to manage their emotions and maintain a positive attitude towards their work. This could indicate that the organizational environment in the company plays a crucial role in the emotional well-being of its employees.

In conclusion, although the results of this research show similarities with other studies on stress and anxiety in remote and hybrid work environments, they also highlight unique aspects related to resilience and organizational support. These findings suggest that while remote work can present significant challenges, it also offers opportunities for personal and professional growth when the right conditions are in place. Future studies could delve deeper into how specific characteristics of the work environment may influence the mental and emotional health of employees, as well as the effectiveness of programs designed to address these problems.

Among the main conclusions of this study, it was possible to obtain a diagnosis of the situation of the collaborators in order to generate the theoretical categories for the prevention program. The main findings of this study were taken into account in order to work directly on the aspects that have the greatest influence on both variables and thus offer better working conditions to employees. In relation to stress and anxiety levels, they were found to be generally high. However, sudden mood swings, frustration, low mood, concentration difficulties, anguish, nervousness, irritability, sadness, excessive worry, anger are perceived, although to a lesser degree.

With respect to research limitations, like people working in the office, remote workers also have difficulty concentrating on their tasks. They are even more easily distracted just because they are at home and don't have a good place to work. Other factors that disrupt your daily routine, such as household chores, can also cause problems.

In addition, the inability to separate professional life from personal life. This is often a major challenge for remote workers to overcome because, without establishing proper regulations, working and living without a work environment can blend into daily life. Inability to distinguish when to do household chores and when to devote time to work.

Among the proposals for continuity and with the objective of achieving more effective results in the implementation of future work stress intervention programs, it is suggested to select a suitable place that provides personnel with the necessary space to carry out the dynamics and ensure the participation of all. In future research, it is advisable not to fragment the sessions, as this will avoid wasting time in reconnecting ideas from one day to the next.

To maintain or improve work stress levels, in addition to the intervention program, it is recommended to prevent work overload and to assess employees' capabilities. In addition, implement coping strategies and styles; as well as healthy living habits. At this stage it is important to establish a work schedule and do everything possible to comply with it. It is also important for the people involved to understand that, although they do not work in the same place, they still play important and responsible roles at work. Likewise, if you work at home, it is necessary to adapt the space, turning it into a "personal office" that stands out from the rest. It is worthwhile to take care of lighting and comfort.

Acknowledgments

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Conflict of Interest

I declare that there is no conflict of interest in conducting the research entitled "Prevention and Attention to Stress and Anxiety Levels in Employees Working in Remote Work Modality". All participants and collaborators involved in this study have been selected impartially and will not receive financial or material benefits that could influence the results of the research.

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Transdiagnostic variables in alcohol consumption in Ecuadorian university students of the Open and Distance Learning Mode

VARIABLES TRANSDIAGNÓSTICAS EN EL CONSUMO DE ALCOHOL ESTUDIANTES UNIVERSITARIOS ECUATORIANOS DE LA MODALIDAD ABIERTA Y A DISTANCIA

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ABSTRACT

Keywords:

alcohol consumption, perceived stress, psychological inflexibility, university students.

Alcohol consumption is a phenomenon present among university students that may be associated with different psychological factors. The objective of this study was to analyze the relationship between alcohol consumption, perceived stress, and psychological inflexibility in three independent groups. Data was collected through online questionnaires and administered to a non-probability sample of 293 open and distance learning university students. The instruments used were the Perceived Stress Scale (PSS-10) and the Acceptance and Commitment Questionnaire-II (AAQ-II). The results show a statistically significant relationship between perceived stress, psychological inflexibility, and alcohol consumption ($p < 0.001$). Higher levels of the transdiagnostic variables (perceived stress and psychological inflexibility) indicate higher levels of alcohol consumption. These results suggest that alcohol may act as a maladaptive coping strategy, increasing the risk of dependence. The results are consistent with previous research but contrast with some studies, possibly due to sociodemographic factors. Interventions targeting stress management and psychological flexibility are crucial. Limitations include the cross-sectional design and the use of self-report questionnaires, which limit causal inferences. The findings emphasize transdiagnostic factors in alcohol use, warranting further research to inform prevention strategies.

RESUMEN

Palabras clave:

consumo de alcohol, estrés percibido, inflexibilidad psicológica, estudiantes universitarios.

El consumo de alcohol es un fenómeno presente entre estudiantes universitarios que puede estar asociados con diferentes factores psicológicos. El objetivo de este estudio fue analizar la relación entre el consumo de alcohol, el estrés percibido y la inflexibilidad psicológica en tres grupos independientes. Los datos se recolectaron mediante cuestionarios en línea y fueron administrados a una muestra no probabilística de 293 estudiantes universitarios de modalidad abierta y a distancia. Los instrumentos utilizados fueron la Escala de Estrés Percibido (PSS-10) y el Cuestionario de Aceptación y Compromiso-II (AAQ-II). Los resultados muestran que existe una relación estadísticamente significativa entre el estrés percibido, la inflexibilidad psicológica y el consumo de alcohol ($p < 0,001$). A mayores niveles de las variables transdiagnósticas (estrés percibido e inflexibilidad psicológica), se observaron mayores niveles de consumo de alcohol. Estos resultados sugieren que el alcohol puede actuar como una estrategia de afrontamiento desadaptativa, aumentando el riesgo de dependencia. Los resultados coinciden con investigaciones previas, pero contrastan con algunos estudios, posiblemente debido a factores sociodemográficos. Las intervenciones dirigidas al manejo del estrés y la flexibilidad psicológica son cruciales. Las limitaciones incluyen el diseño transversal y el uso de cuestionarios de autoinforme, lo que limita las inferencias causales. Los hallazgos enfatizan los factores transdiagnósticos en el consumo de alcohol, lo que justifica una mayor investigación para fundamentar las estrategias de prevención.

Introduction

Alcohol is one of the most widely consumed substances worldwide, and its use has accompanied mankind throughout history. However, its consumption is not without risk, as it has been shown to cause serious physical and mental health problems, as well as being associated with high morbidity and various socioeconomic consequences. According to the World Health Organization (WHO), alcohol is responsible for more than 200 diseases, including cirrhosis of the liver, some types of cancer and cardiovascular disease. It also increases the risk of developing mental health problems such as alcoholism and other mental disorders (WHO, 2022).

Despite efforts to reduce its consumption, alcohol remains a major cause of mortality in many regions. In the Americas, for example, it is estimated that alcohol consumption contributes to more than 300,000 deaths annually, representing 5.5% of all deaths. In this region, the impact is greater among men, who account for 83.1% of deaths directly related to alcohol. Gender differences in relation to alcohol consumption are more pronounced in countries such as El Salvador and Belize, while in nations such as Canada and the United States the disparities are smaller (PAHO, 2021).

Alcohol use disorder is defined as a chronic, recurrent condition that affects both the brain and the individual's behavior. Those with this disorder have difficulty controlling their alcohol consumption, even when faced with adverse consequences in their health, social or work life. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V), alcohol use disorder is characterized by a range of symptoms including loss of control over drinking, increasing tolerance to the effects of alcohol, and persistence in using the substance despite negative consequences. Moreover, this disorder can present in different degrees of severity: mild, moderate or severe (NIH, 2023; Coriale et al., 2018).

Problem drinking is also associated with a pattern of harmful drinking, characterized by intoxication and intermittent heavy drinking. This pattern often includes episodes of abuse that not only affect the physical health, but also the quality of life and interpersonal relationships of the consumer. According to WHO (2020), the physiological characteristics of alcohol dependence include tolerance to its effects and withdrawal symptoms that may occur when alcohol consumption is reduced. These symptoms of dependence may be observable after a period of constant use of at least one month.

Alcohol consumption is not homogeneous worldwide, as factors such as geographic region, socioeconomic status and cultural differences influence drinking patterns. In the Americas, per capita consumption in 2019 was 7.6 liters, a figure that exceeds the world average by 1.3 times (PAHO, 2023). Although the percentage of adults consuming alcohol in the Americas decreased from 57.8% to 46.1% between 2010 and 2016, the amount of alcohol consumed by drinkers increased from 14.7 to 15.1 liters of pure alcohol during the same period (WHO, 2020). This increase in alcohol consumption by drinkers is not insignificant from a public health perspective, as it is associated with an increased burden of morbidity and mortality.

Within the Americas, countries such as Barbados, the United States, St. Lucia, Argentina and Chile have the highest levels of total alcohol consumption per capita. In contrast, countries such as Guatemala have the lowest consumption levels in the region (Reynaless-Shigematsu et al., 2023). However, regardless of the country, alcohol

consumption tends to be higher in men than in women. In 2019, the average consumption in American men was 11.9 liters, while that of women was 3.5 liters per person (PAHO, 2023).

In Ecuador, a country with high rates of alcohol consumption, the average age at which alcohol consumption begins is between 14 and 17 years of age. According to a national survey conducted in 2018, 24.1% of adults aged 18-69 admitted to binge drinking. This trend is even more concerning among college students, where 49.7% of males and 23.8% of females reported harmful alcohol consumption (Pengpid and Pelzer, 2020). In addition, in 2023, an alcohol consumption rate of 80% was recorded in this population, with a rate of 28% for risk consumption (Moreta-Herrera, 2023).

Alcohol consumption and its relationship with risk factors are the subject of numerous studies. Certain psychological and sociodemographic factors, such as impulsivity, social class, marital status and gender, have been found to be predictors of problem drinking (Shephard et al., 2023). Mood disorders, such as anxiety and depression, have also been identified as being closely related to the development of alcohol problems, as many people turn to alcohol as a coping mechanism for stress and other emotional problems (Mercer et al., 2023; Adeyinka et al., 2023).

From a theoretical perspective, there are several models that attempt to explain the mechanisms underlying alcohol use disorder. The traditional medical model, for example, suggests that alcohol abuse is a direct consequence of the interaction between human neurobiological processes and the effects of the substance. On the other hand, the biopsychosocial model holds that alcohol consumption is the result of the interaction between biological, psychological and social factors, recognizing the complexity of the causes of this addiction (Bilali et al., 2023).

The transdiagnostic model has gained relevance in modern psychology and psychiatry, as it seeks to identify the fundamental processes underlying a variety of psychological disorders. This approach posits that many mental disorders share common etiological mechanisms and that identification of these processes can help develop more effective interventions. One of the most prominent transdiagnostic factors in the literature is psychological inflexibility, which refers to the individual's inability to adapt to changing situations or to cope with unpleasant thoughts and emotions (Hayes et al., 1996; Giommi et al., 2023).

Psychological inflexibility manifests itself through processes such as cognitive fusion, in which deeply held thoughts and beliefs are perceived as absolute truths that control behavior, and experiential avoidance, which involves the desire to escape uncomfortable emotions or memories. Research has shown that people with high levels of psychological inflexibility are more likely to develop psychological problems, including those related to alcohol use (Serowik and Orsillo, 2019).

A study by Luoma (2020) found that individuals with greater psychological inflexibility and negative affect drank more when alone ($p < .001$). In addition, experiential avoidance was found to be associated with more harmful forms of alcohol consumption, especially in those with low levels of negative affect. This finding suggests that psychological inflexibility may not only contribute to the development of alcohol problems, but also influence how people respond emotionally to stressful situations.

Perceived stress is another transdiagnostic factor that has been studied in relation to alcohol consumption. Perceived stress refers to a person's subjective perception of the severity or impact of a stressful event, and has been shown to be closely related to a number of mental health problems. In the context of alcohol consumption, perceived stress may act as a trigger, as many people turn to alcohol to relieve anxiety or emotional

distress associated with stressful situations (Fasset et al., 2020).

A study carried out by Schick et al. (2023) found a significant correlation between perceived stress, positive emotions and motives for coping with alcohol consumption. In this study, the researchers concluded that perceived stress and positive emotions were correlated with greater excessive alcohol consumption. Similarly, Flaudias et al. (2021) demonstrated that college students with high levels of perceived stress during the COVID-19 pandemic had a higher prevalence of addictive behaviors, including alcohol abuse ($p = 0.004$).

On the other hand, recent studies suggest that psychological inflexibility may also mediate the relationship between perceived stress and alcohol consumption. A study by Duplessis-Marcotte et al. (2023) demonstrated that individuals with high levels of cortisol ($p = 0.075$) and perceived stress ($p = 0.037$) were more likely to increase their alcohol consumption during periods of elevated stress. These findings reinforce the idea that both psychological inflexibility and perceived stress are key variables in the development of alcohol use disorders.

In conclusion, research has shown that alcohol consumption is influenced by a number of transdiagnostic factors, including psychological inflexibility and perceived stress. These factors not only contribute to the development of alcohol problems, but also act as mediators between other psychological disorders and substance use. Although progress has been made in understanding these processes, further research is needed to develop more effective interventions to address the underlying causes of alcohol use disorder. The study of these transdiagnostic factors could provide a new perspective on how to treat and prevent this addiction, and offer more effective tools to improve the mental health and well-being of those struggling with alcoholism.

Method

Type and Design of Research

The type of research was field, cross-sectional, ex post-facto and causal comparative. It was field because the variables were measured in their natural environment; and cross-sectional because the data were collected at a single moment in time (Hernández-Sampieri & Mendoza, 2018). Likewise, it was ex post-facto because data were collected from an event that had already occurred and comparative causal because the possible relationship between alcohol consumption and transdiagnostic variables in open and distance university students was investigated.

The research design was non-experimental with three independent groups of students with different alcohol levels. It is considered non-experimental because no variables were manipulated. The three independent groups were divided according to the frequency or level of alcohol consumption based on item "b" of the Alcohol, Tobacco and Other Substance Use Screening Test (ASSIST); the groups were:

- a). Non-drinking or one or two-time college students.
- b). College students who consume alcohol on a monthly or weekly basis.
- c). College students who consume alcohol on a daily or near-daily basis

Population and Sample

The population was the university students of the open and distance modality of a private university in Ecuador who studied in the academic period October 2021-February 2022.

The sample consisted of 293 university students (100%), among whom 105 were men (35.8%) and 188 women (64.2%) aged between 18 and 66 years ($M=30.21$; $SD=8.79$). The nationality of all participants was Ecuadorian (100%). The marital status of 58.0% corresponds to single and 36.9% are in level 7 in relation to subjective social class (see Table 1).

Table 1.

Sociodemographic characteristics of the sample

<i>Variables</i>	<i>M</i>	<i>DE</i>	<i>Min/Max</i>	<i>N</i>	<i>%</i>
Age	30,21	8,79	18/66	293	100%
Sex	Men			105	35,8%
	Women			188	64,2%
Nationality	Ecuadorian			293	100%
	Another				
Marital status	Single			170	58,0%
	Married			76	25,9%
	Free union			21	7,2%
	Separated -			25	8,5%
	Divorced			1	0,3%

Note. Sample size (N) = 293; M = mean; SD = standard deviation; Min = maximum value; Max = minimum value; n = simple absolute frequency; % = percentage.

Inclusion Criteria

- A. The student must be enrolled in an undergraduate career in the open and distance modality during the academic period October 2021-February 2022.
- B. The student must freely agree to be part of the study by means of informed consent.
- C. The student must answer the instruments in their entirety.

Exclusion Criteria

- A. Not be enrolled in an undergraduate university career in the open and distance modality.
- B. Be a graduate student.
- C. Failure to accept informed consent.
- D. Failure to respond to the instruments in their entirety.

Instruments

An online survey composed of a series of short, psychometrically validated scales was administered to measure indicators of mental health and substance use.

Sociodemographic data questionnaire (Ad hoc): This questionnaire was applied to collect the sociodemographic data of the sample. Data were collected on sex, age, nationality, marital status, subjective social class, and university of undergraduate study.

The application time was five to ten minutes and was applied individually.

Action and Commitment Questionnaire (AAQ-II; Bond et al., 2011; Ruiz et al. version, 2013; Paladines-Costa et al., 2021): The Action and Commitment Questionnaire (AAQ-II) was developed by Bond et al. (2011) with the aim of having a brief instrument to assess psychological inflexibility. The application time is between 5 and 10 minutes, and can be self-administered. It is a seven-item Likert scale, in which 1 represents "never true", 4 "sometimes true" and 7 "always true". The higher the score, the greater the psychological inflexibility (Jarrín and Ponce, 2023). The items assess aspects such as experiential avoidance, the inability to stay focused on the present and reevaluating the direction of actions when internal psychological events are present. The AAQ-II has adequate discriminant validity, a Cronbach's alpha coefficient of $\alpha=0.84$ and test-retest reliability of $r=0.81$ (Bond et al., 2011). As for the version translated into Spanish, a coefficient $\alpha=0.88$ was found (Ruiz et al., 2013). Within the Ecuadorian context, the Spanish version showed high reliability ($\alpha=0.919$; $\omega=0.928$) in a sample of university students (Paladines-Costa et al., 2021). The factor structure is unidimensional (Ruiz et al., 2013).

Perceived Stress Scale (PSS-10; Cohen et al., 1983; Spanish version: Remor, 2006): This instrument was originally designed by Cohen et al. (1983) to quantify the perception of psychological stress, considering how everyday situations are viewed in terms of stress. The questions of this scale include a series of questions focused on determining the degree of stress perceived in the last month. It is applied in an estimated time of 5 to 10 minutes and is self-applied. The Perceived Stress Scale contains 10 items, whose response options are in Likert-type format. It offers five response options that can be scored from 0 to 4: 'never', 'almost never', 'sometimes', 'frequently' and 'always'. These answers are scored from zero to four. However, it is important to note that the responses to items 4, 5, 7 and 8 are scored oppositely or inverted. The higher the score, it is interpreted as higher perceived stress (Campo-Arias et al., 2014). The original version has a high reliability ($\alpha=0.78$; $\omega=0.87$). The factor analysis is described by a 2-factor model: negative feelings in relation to stress and perceived self-efficacy (Taylor, 2015). With respect to the Spanish version, developed by Remor (2006), a high reliability was found ($\alpha=0.81$; test-retest, $r=0.73$). Concurrent validity and sensitivity are also optimal for this instrument.

Alcohol, tobacco and substance use screening test (ASSIST; WHO, 2011): The alcohol, tobacco and substance use screening test was developed by WHO (2011) to assess substance use and identify the level of risk of use. The questionnaire consists of 8 psychological items and is presented in a Likert-type format. However, only item "b" of this questionnaire, referring to the frequency of alcohol consumption, was used to form groups according to the level of alcohol use. It was designed to obtain data on the history of drug use, regularity of use in the last trimester, desire to use substances, complications and actions not taken because of drug use. It is administered in an estimated time of five minutes in the adult population and is heteroapplied. The ASSIST questionnaire has adequate internal consistency ($\alpha=0.71$) and a total variance of 41, 5% (Bonsksen, 2018). This instrument presents good convergent validity with the Pittsburgh Sleep Quality Index (PSQI), the Copenhagen Burnout Inventory (CBI) and the Patient Health Questionnaire-9 (PHQ-9) scale (Fernandez-Neto et al., 2023).

Procedure

For the execution of this research, the database registered during the covid-19 pandemic, from October to February 2021-2022 in Ecuador, was used. This project was carried out by the Universidad Técnica Particular de Loja and is entitled: "Transdiagnostic

model of alcohol consumption and mental health in Ecuador". It was developed and implemented in conjunction with the Ministry of Public Health and directed by PhD. Víctor Manuel López Guerra. The procedure used for data collection is detailed below.

Once approval has been obtained from the Ethics Committee for Research on Human Subjects (CEISH) of the Universidad San Francisco de Quito (USFQ), registered with approval code number (CEISH: 2021-072E), and complying with the established ethical principles of the Declaration of Helsinki, participants were recruited through announcements carried out by the Ministry of Public Health and the National Secretariat of Higher Education, Science, Technology and Innovation (SENESCYT).

Data collection was carried out using ArcGIS software. First, the informed consent form was presented, by which participants could accept their anonymous and voluntary participation. Subsequently, if they agreed to be part of the study, participants were presented with the instruments in the following order:

- Sociodemographic questionnaire (Ad Hoc).
- Perceived Stress Scale (PSS-10).
- Acceptance and Action Questionnaire (AAQ-II).

Finally, the results were collected for approximately five months and stored on the web server for five years.

Data Analysis

First, in order to respond to the first research objective, a descriptive analysis of each variable was performed, including the calculation of the mean and standard deviation.

Secondly, to determine how alcohol consumption is related to transdiagnostic variables, a MANOVA analysis was applied, considering a significance level of 0.05. The effect size was measured using the partial eta squared statistic, taking into consideration the values of small (0.01 - 0.05), medium (0.06 - 0.13) and large (0.14) effects. To identify differences between groups, the Bonferroni post hoc rank test was used with a significance level ≤ 0.05 . Data analysis was performed using SPSS software, version 29.

Results

As a preamble to answering the objectives of the study, we sought to know the internal consistency of the psychological instruments by means of Cronbach's Alpha coefficient (α), which allows us to measure the reliability of the instrument. An optimal Cronbach's alpha (α) should have a value equal to or greater than 0.80 (Streiner, 2010).

Table 2.
Cronbach's alpha of psychological instruments

Instruments	Reliability Cronbach's Alpha (α) (Total)
Perceived Stress Scale (PSS-10)	$\alpha = 0,852$

Acceptance and Commitment Questionnaire-II (AAQ-II)	$\alpha = 0,961$
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Table 2 shows the total Cronbach's Alpha (α) value of both psychological instruments used, of which positive item-total correlations and satisfactory internal consistency are reported for the Perceived Stress Scale (PSS-10) ($\alpha=0.852$) and the Acceptance and Commitment Questionnaire-II (AAQ-II) ($\alpha=0.961$). Therefore, the results demonstrate that the subjects' responses were consistent on each item of the instruments and thus, both instruments are reliable.

In order to respond to the specific objectives of the research, three groups were formed according to the level of alcohol consumption and then the data were balanced to obtain a database with equal groups of participants. The relevant calculations and statistical tests were then performed.

Table 3.

Analysis of transdiagnostic variables in the three groups with different levels of alcohol consumption.

Variables	Group 1	Group 2	Group 3	Total	F	P	η^2
	N=104	N=99	N=90	N=293			
	M (\pm SD)						
Perceived stress	14,96 (7,80)	14,56 (5,30)	20,71 (7,35)	16,59 (7,94)	19,761	<0,001 1-2* 1-3* 2-3*	0,120
Psychological inflexibility	16,07 (7,59)	28,82 (8,80)	38,53 (8,16)	27,81 (12,32)	31,475	<0,001 1-2* 1-3* 2-3*	0,178

Note. M = mean; SD = standard deviation; F = frequency; P = significance level; η^2 = partial eta squared; Group 1 = does not consume, or consumes 1 or 2 times; Group 2 = consumes every month or every week; Group 3 = consumes daily or almost daily; *p < 0.05.

The results obtained after performing the MANOVA analysis showed significant differences ($p < 0.05$) between the mean scores of the variables perceived stress and psychological inflexibility in the three groups according to the degree of alcohol consumption. First, it is evident that the third group obtained higher scores of perceived stress ($M=20.71$; $SD=7.35$) in comparison to group two made up of monthly/weekly consumers ($M=14.56$; $SD=5.30$) and group one made up of non-consumers or people who consume 1 or 2 times ($M=14.96$; $SD=7.80$) in the total score ($F=19.761$; $p < 0.001$; $\eta^2 = 0.120$). On the other hand, it is observed that the third group presents higher levels of psychological inflexibility ($M=38.53$; $SD=8.16$) with respect to the levels reported in the second group ($M=28.82$; $SD=8.80$) and the first group ($M=16.07$; $SD=7.59$) in the total score ($F=31.475$; $p < 0.001$; $\eta^2 = 0.178$).

Thus, it is evident that the lowest score, both in terms of mean and standard deviation, corresponds to the first group while the highest corresponds to group three; it is observed that the higher the alcohol levels, the higher the levels of perceived stress and psychological inflexibility. On the other hand, the partial eta squared statistic showed a

moderate to large effect size on the three groups with different levels of alcohol consumption; with the perceived stress variable having the smallest effect size and psychological inflexibility the largest, with a value greater than $\eta^2 = 0.14$.

The Bonferroni post hoc test was also used to identify which groups differed from each other. This test identified that between both variables there are statistically significant differences ($p < 0.05$) between the first and second groups; the first and third groups and the second and third groups. The results suggest that there is a relationship between consumption levels and transdiagnostic variables.

Discussion and Conclusions

As mentioned above, the general objective of the research was to analyze the relationship between psychological inflexibility and perceived stress with alcohol consumption in a sample of university students. The findings of this study show that as levels of alcohol consumption increased, so did levels of perceived stress and psychological inflexibility.

In other words, this study corroborates the existence of a positive relationship between alcohol consumption levels and perceived stress, which could suggest that students use alcohol as a coping mechanism in stressful situations. These results are consistent with the findings of Schick et al. (2023), who found that stress is positively correlated ($p < .001$) with heavy drinking in the university population.

The results of this study are also in line with the results of other authors who evidenced that people with a high level of perceived stress might consume more alcohol to mitigate their stress, thus increasing the risk of developing alcohol dependence when their healthy coping abilities are limited (Böke et al., 2019; Duplessis- Marcotte et al., 2023) However, these findings differ from the study by Rodriguez et al. (2023), where it was observed that there was no statistically significant correlation ($p = 0.484$) between alcohol consumption and different levels of stress. This discrepancy could be due to the fact that the study sample was made up of Hispanic immigrants from the United States, meaning that this group could present different sociodemographic characteristics, for example, differences at the sociocultural or economic level. This could explain the divergence of results compared to those found in university student populations.

On the other hand, the results of the present investigation show that as alcohol consumption levels increase, so do psychological inflexibility scores. This suggests that alcohol use may be reducing the ability of individuals to adapt to situations that involve negative internal experiences and represent a difficulty in acting in accordance with meaningful personal values.

Alcohol consumption can be used as a strategy to avoid psychological distress despite negative consequences such as the risk of developing excessive alcohol consumption or even other pathologies, such as depression or anxiety. It also increases the risk of suicide. (Reynolds et al., 2015). These findings are aligned with existing literature, for example, the study by Serowik and Orsillo (2019) found that psychological inflexibility is a contributing factor to the development and maintenance of heavy drinking, despite psychological inflexibility presenting a stronger relationship ($p < 0.01$.) with substance dependence than with substance abuse ($p = 0.12$).

It is also important to note that Sánchez-Puertas et al. (2022) indicate that psychological inflexibility significantly predicts alcohol consumption ($b = 0.064$; $p < 0.001$). Other studies point out that psychological inflexibility may positively mediate

between stress and substance abuse (Barenz, 2017; Kheirabadi et al., 2021).

On the other hand, in terms of practical implications, these findings have important applications that can be concretized in the design of intervention programs on alcohol consumption aimed at the university population. For example, these programs may include adaptive coping strategies for stress management, as well as providing tools to address psychological inflexibility. These techniques will be beneficial in providing college students with an alternative approach to managing stressful situations and other negative emotional states, as well as addressing alcohol consumption.

In addition, it should be mentioned that the number of studies addressing the relationship of the three variables is limited, highlighting the need for further research to confirm and clarify the relationship between these variables. Thus, this study contributes to the existing body of literature on the relationship of perceived stress and psychological inflexibility, as transdiagnostic variables, on alcohol consumption among college students.

However, it is important to keep in mind some limitations of this study when interpreting the results. For example, the cross-sectional nature of the research design precludes drawing causal inferences about the relationship between perceived stress, psychological inflexibility, and alcohol consumption. In addition, the sample consisted primarily of undergraduate students from a single institution, which limits the generalizability of the findings to other university populations.

Other limitations are related to the form of data collection, given that it was carried out by means of self-administered questionnaires, which may be subject to biases involving memory errors, the desirability effect or the tendency to respond affirmatively regardless of the veracity of the answers. Finally, the use of a non-probabilistic sample selected by convenience may also introduce selection biases, limiting the representativeness of the sample and preventing extrapolation of the findings to other populations or contexts, which affects the external validity of the study.

In summary, this study provides insight into how transdiagnostic variables act on drinking behavior. These findings underscore the need for effective interventions that address both the emotional and cognitive aspects of alcohol use among this vulnerable population.

Conclusions

This study empirically supports that psychological inflexibility and perceived stress are significantly associated with alcohol consumption in college students. The levels of psychological inflexibility and perceived stress varied according to the frequency of consumption, with lower scores on the transdiagnostic variables in the first group corresponding to low levels of consumption. While students with higher levels of alcohol consumption have higher levels of perceived stress and psychological inflexibility, suggesting that students may be using alcohol as a coping mechanism to deal with stress and aversive internal experiences.

Finally, this research supports the study of alcohol consumption from a transdiagnostic approach, where it is corroborated that certain psychological factors may underlie alcohol consumption behavior. This is important because it may lead to more effective and accessible psychological interventions targeted for college students.

Recommendations

For future research, it is suggested to take into account the following aspects that will allow addressing the limitations of the study; it is recommended to expand the study

sample and include university students from different institutions in order to be able to make generalizations about other student populations.

It is also recommended to evaluate and analyze the moderating effect of psychological inflexibility on perceived stress and alcohol consumption, which will provide a deeper understanding of the mechanisms underlying this behavior. In addition, it is important to evaluate other transdiagnostic variables such as the perception of loneliness or impulsivity that could influence alcohol consumption.

Based on the above, it is suggested to develop intervention strategies that address transdiagnostic factors underlying drinking behavior, such as the variables studied in this research. Finally, it is recommended to create transdiagnostic primary, secondary and tertiary prevention programs aimed at the university population in order to reduce alcohol consumption levels.

Conflict of interest

There is no conflict of interest.

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EFFECTS OF THE THERAPEUTIC GAME *CRECIENDO EN MINDFULNESS (CEM)* ON EMOTIONAL AND BEHAVIORAL PROBLEMS IN JUVENILE OFFENDERS AT THE “JALTEVA” PEDAGOGICAL INTERNMENT CENTER IN HONDURAS

Efectos del Juego terapéutico creciendo en mindfulness (CEM) sobre los problemas emocionales y de conducta de los menores en conflicto con la ley penal del cpi “Jalteva” en Honduras

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ABSTRACT

Keywords:

Mindfulness, therapeutic game; minors in conflict with criminal law, emotional problems, behavioral problems.

This study evaluated the effectiveness of the therapeutic game *Creciendo en Mindfulness* (Growing in Mindfulness, *CEM*) in reducing emotional and behavioral problems among adolescents confined in the “Jalteva” Pedagogical Internment Center in Honduras. A one-group, pre-experimental pretest-posttest design was employed ($n = 27$; ages 13–18). Before and after four *CEM* sessions, participants completed the *Cuestionario para la Evaluación de Problemas en Adolescentes* (Questionnaire for the Assessment of Adolescent Problems, Q-PAD) and the Personality Assessment Inventory–Adolescent (PAI-A). Changes were analyzed using the Wilcoxon signed-rank test, and effect sizes were calculated with Hedges’ g . After the intervention, uncertainty about the future decreased from the 86th to the 71st percentile ($p = .011$; $g = -0.46$), and perceived lack of social support declined from $T = 64$ to 58 ($p = .032$; $g = -0.45$). However, aggressive attitude increased from $T = 55$ to 58 ($p = .037$; $g = 0.28$). The correlation pattern among scales became more coherent, suggesting greater emotional awareness. The findings suggest that *CEM* yielded specific improvements in internal variables related to anticipatory anxiety and perceived support, though its overall impact on emotional and behavioral symptomatology was limited. Institutional constraints, the absence of a control group, and the short follow-up period restrict causal attribution and generalizability. It is recommended to complement the program with individualized interventions and family involvement to enhance adolescents’ social reintegration.

RESUMEN

Palabras clave:

Mindfulness, juego terapéutico; menores en conflicto con la ley penal, problemas emocionales, problemas conductuales.

Este estudio evaluó la eficacia del juego terapéutico *Creciendo en Mindfulness* (CEM) para disminuir los problemas emocionales y de conducta en adolescentes internados en el Centro Pedagógico de Internamiento "Jalteva", Honduras. Se adoptó un diseño preexperimental de preprueba-posprueba con un único grupo ($n = 27$; 13-18 años). Antes y después de cuatro sesiones del CEM, se aplicaron el Cuestionario para la Evaluación de Problemas en Adolescentes (Q-PAD) y el Inventario de Evaluación de la Personalidad para Adolescentes (PAI-A). Los cambios se analizaron mediante la prueba de rangos con signo de Wilcoxon y se estimó el índice g de Hedges. Tras la intervención, la incertidumbre sobre el futuro bajó del percentil 86 al 71 ($p = .011$; $g = -0.46$) y la percepción de falta de apoyo social descendió de $T = 64$ a 58 ($p = .032$; $g = -0.45$). Sin embargo, la actitud agresiva aumentó de $T = 55$ a 58 ($p = .037$; $g = 0.28$). El patrón de correlaciones entre escalas se volvió más coherente, lo que sugiere una mayor conciencia emocional. Los hallazgos indican que el CEM genera mejoras puntuales en variables internas asociadas con la ansiedad anticipatoria y el apoyo percibido, aunque su impacto global sobre la sintomatología emocional y conductual fue limitado. Factores institucionales, la ausencia de un grupo control y el corto seguimiento restringen la atribución causal y la generalización. Se recomienda complementar el programa con intervenciones individualizadas y acompañamiento familiar para potenciar la reinserción social de los adolescentes.

Introduction

Adolescence is a period of intense biological, cognitive and social reorganization in which the search for autonomy, group pressure and impulsivity converge to increase the likelihood of risky behaviors. When these behaviors transgress criminal law, young people enter juvenile justice circuits that often reinforce stigmatization and reproduce violent dynamics. In Latin America -and particularly in Honduras- socio-educational measures are developed in contexts of limited resources, with aging infrastructure and scarce professional staff, which makes it difficult to implement evidence-based programs. Added to this is the high prevalence of emotional and behavioral disorders in minors in conflict with the law: depression, anxiety, substance use, antisocial traits and interpersonal problems that, if not addressed, increase the risk of recidivism and chronification of the crime.

Several meta-analyses have shown that cognitive-behavioral programs reduce juvenile recidivism, but their effectiveness decreases when they are applied in a brief or merely informative manner. In parallel, the literature of the last two decades has consolidated mindfulness - defined as conscious, deliberate and non-judgmental attention to the present moment (Kabat-Zinn, 1994) - as an effective strategy to improve self-regulation, stress management and mental health in adolescence. Controlled trials in school settings have shown small or moderate decreases in anxiety and depression symptoms (Dunning *et al.*, 2019), while, in correctional facilities, the results are still incipient: studies with small samples report improvements in impulsivity and rumination, but point to difficulties in adherence derived from the low motivation and punitive climate that characterizes many correctional facilities.

Latin American research on mindfulness in juvenile justice is, to date, practically nonexistent. The few studies identified are concentrated in Brazil and Chile, use imported protocols without sociocultural adaptation and lack playful formats, despite the fact that gamification -or gamification, according to the RAE- has shown promise for increasing the participation of reluctant groups. Specifically, mindfulness-based therapeutic games facilitate experiential practice, promote cooperation and translate abstract concepts - such as acceptance or compassion - into concrete dynamics that resonate with adolescents' everyday lives. However, empirical evidence on its effectiveness is limited to school and clinical populations; there are no published studies in juvenile detention centers in the region.

The "Jalteva" Pedagogical Internment Center, under the National Institute for the Care of Juvenile Offenders (INAMI), exemplifies the challenges described above. Located in the municipality of Cedros, department of Francisco Morazán, it houses boys between the ages of 12 and 18 who are serving precautionary measures or sanctions. Inmate turnover, limited financial resources (L 5000 per quarter for materials) and the priority given to the traditional disciplinary regime leave little room for systematic psychotherapeutic interventions. However, the management team has expressed interest in innovative strategies that strengthen resilience and reduce recidivism, provided they are feasible and culturally relevant.

The therapeutic game *Growing in Mindfulness* (CEM), designed *ad hoc* for Latin American juvenile forensic contexts, fits into this void. CEM integrates mindfulness principles - breath awareness, body scanning, observation of thoughts and emotions - with board dynamics, challenge cards and cooperative work that reward impulse regulation and perspective taking. Its development could easily be inspired by evidence linking the playful format to increased intrinsic motivation and adherence, particularly among adolescents with a history of substance use and low tolerance for lengthy verbal

interventions. In addition, CEM relies on a restorative justice perspective, fostering empathy and responsibility for one's own decisions.

Despite the potential of playful mindfulness, crucial questions remain: can a program of four short sessions modify emotional and behavioral problems in a custodial setting, which dimensions are most sensitive to change, are there undesirable effects - e.g., a transient increase in irritability - when emotional awareness is introduced without accompanying intensive behavioral techniques, and are there any undesirable effects when emotional awareness is introduced without accompanying intensive behavioral techniques? Answering these questions is relevant for guiding Honduran public policy on juvenile justice and for expanding the international body of evidence-based interventions in forensic populations.

The present study aims to evaluate the effectiveness of CEM in reducing emotional (anxiety, depression, uncertainty about the future, perceived lack of support) and behavioral (substance use, antisocial traits, aggressiveness) problems in 27 adolescent inmates at "Jalteva". Based on a quasi-experimental pretest-posttest design with a single group - chosen for ethical and logistical reasons - two instruments validated in Spanish were administered: the *Questionnaire for the Assessment of Problems in Adolescents* (Q-PAD) and the *Personality Assessment Inventory for Adolescents* (PAI-A). Semi-structured interviews with the then director of the center and participant observation were added to capture the institutional climate and triangulate the quantitative results.

Exploratory correlations between the homonymous scales of the Q-PAD and the PAI-A were analyzed, with the expectation that the practice of mindfulness would improve consistency in symptomatic self-perception.

The social relevance of the study has at least two sides. First, it offers local evidence of a low-cost, easy-to-replicate intervention that can be incorporated into institutional routine without requiring highly specialized personnel. Second, it contributes to the Sustainable Development Goals agenda, particularly SDG 16 (peace, justice and strong institutions), by promoting non-violent rehabilitation strategies and reducing the likelihood of recidivism. From an academic perspective, the findings are inserted in the debate on the minimum effective dosage of mindfulness programs and on the need for cultural and playful adaptations in juvenile justice contexts.

In summary, we propose a pioneering study that explores the feasibility and preliminary impact of a mindfulness-based therapeutic game in Honduran adolescents deprived of liberty. By integrating international evidence with the institutional reality of "Jalteva", the work aims to bridge the gap between research and practice, offering concrete directions for future quasi-experimental and experimental interventions that deepen the comprehensive rehabilitation of juveniles in conflict with the criminal law.

Method

The present study evaluated the effectiveness of the therapeutic game * Growing in Mindfulness (CEM) to reduce emotional and behavioral problems in 27 male adolescents aged 13 to 18 years in conflict with criminal law, inmates of the Pedagogical Center of Internment "Jalteva", administered by the National Institute for the Care of Juvenile Offenders (INAMI) and located in the municipality of Cedros, department of Francisco Morazán (Honduras). The choice of a mindfulness-based playful intervention responded, on the one hand, to the empirical support that mindfulness offers for self-regulation and well-being (Kabat-Zinn, 1994; Dunning et al., 2019) and, on the other hand, to the scarcity

of Latin American research combining mindfulness and playful activities in juvenile forensic contexts (Cheang et al., 2019).

A pre-experimental pretest-posttest design with a single group was used, suitable as an initial feasibility approach in a setting with logistical, ethical and resource constraints, even accepting the internal validity limitations inherent to the absence of a control group (Hernández-Sampieri and Mendoza-Torres, 2018). This design was relevant because it avoided the complexity of randomization and parallel groups -which would have exceeded institutional capacity-, contemplated the high turnover of inmates that makes it difficult to create equivalent groups, ensured equity by offering the intervention to all participants, and laid a preliminary foundation for subsequent quasi-experimental or experimental studies.

The work was carried out in three successive stages. First, the Questionnaire for the Assessment of Problems in Adolescents (Q-PAD) and the Personality Assessment Inventory for Adolescents (PAI-A) were administered to establish the baseline. Then, four fifty-minute sessions were given -two per week- in which practices of attention to breathing, body awareness and impulse regulation were integrated within game dynamics adapted to the low motivation characteristic of this population. Finally, the Q-PAD and PAI-A were administered again to measure variations. It was planned to monitor possible dropouts by interviewing caregivers and recording causes; however, there were no dropouts, perhaps due to the brevity of the program. The choice of four sessions balanced previous evidence (Kostova et al., 2019; Sams et al., 2018) with the limitations of the CPI, although future research could extend the intervention or incorporate medium-term follow-ups.

"Jalteva, with more than fifty-eight years of experience, serves adolescents in conflict with the law from a multidisciplinary perspective based on human rights and offers education, health and psychosocial support. For this research, males between 13 and 18 years of age subject to precautionary measures or criminal sanctions were included; minors under thirteen or over eighteen years of age, those with serious psychiatric or medical disorders, and those without informed consent were excluded. Given the small size of the population and its constant rotation, we opted for a census sampling that covered the 27 adolescents available, which reduced bias and improved external validity for the institutional context.

The independent variable was the treatment based on the CEM therapeutic game. The dependent variables were divided into emotional problems-body dissatisfaction, anxiety, depression, uncertainty about the future, self-esteem and well-being, somatic complaints, schizophrenia, borderline traits, suicidal ideation, stress, and lack of social support-and behavioral problems-substance abuse, drug and alcohol problems, interpersonal and family problems, psychosocial risk, antisocial traits, mania, paranoia, aggression, refusal of treatment, anxiety disorders (obsessive-compulsive disorder, phobias, post-traumatic stress disorder), dominance and agreeableness. Following the methodological arguments of Thomas (2020) and the authors he compiles, Likert-type scales were treated as ordinal data.

The intervention was based on six theoretical foundations:

1. The emotional self-regulation offered by mindfulness, reducing anxiety, depression and irritability.
2. The reduction of dysfunctional behaviors thanks to the playful component that encourages reflection and impulsive control.
3. The strengthening of body awareness and self-concept, with the consequent reduction of body dissatisfaction and improvement of self-esteem.
4. Increased resilience and coping with stress and uncertainty.

5. Motivation derived from the game format, which increases adherence and favors prosocial interaction.
6. Complementarity with other institutional psychoeducational programs.

Three tools were used for the evaluation. The Q-PAD-81 items distributed in nine scales, with internal reliability between 0.78 and 0.91 and validation in Spanish-speaking forensic contexts (Borrás et al., 2017)-provided a quick screening of critical areas. The PAI-A -264 items organized into 22 scales, adapted to Spanish with Latin American scales and frequent use in forensic settings (Morey et al., 2018)-delved into clinical features and controlled the validity of the responses. Finally, a structured interview with the director of "Jalteva" made it possible to identify and contrast current institutional strategies with scientific evidence. The combination of these instruments provided a robust and culturally relevant measure: the Q-PAD provided brevity and reliability, the PAI-A offered comprehensive coverage, and the interview added contextual perspective, although each tool presented its own limitations, such as potential self-report bias and reliance on participant motivation and honesty.

In the quantitative analysis, direct scores, percentiles and T-scores of the Q-PAD and PAI-A were compared before and after the intervention, applying appropriate statistics for ordinal data. For the qualitative analysis, the institutional interview was subjected to a thematic analysis that categorized the existing strategies and their empirical support. The innovation of validating mindfulness gamification as a way to develop self-awareness, self-regulation and prosociality was contemplated, although the limitation of generalizing the findings to other contexts was recognized due to the uniqueness of the CPI "Jalteva", the predominance of male participants and the forensic nature of the sample.

In summary, the methodology managed to balance feasibility and conceptual rigor: the pre-experimental design allowed us to assess the feasibility of CEM without transgressing ethical principles or overloading the system; the triangulation of psychometric instruments and qualitative data enriched the comprehensive understanding of the participants and their environment; and, although threats to internal validity -history or maturation- remain, the initial findings provide a basis for future quasi-experimental or experimental studies with control groups, larger sample sizes and longitudinal follow-ups.

Results

Overview

This section systematically presents the findings derived from the application of the therapeutic game *Growing in Mindfulness* (CEM) in 27 adolescent inmates of the Pedagogical Internment Center "Jalteva". The quantitative results - descriptive analysis, contrast tests and magnitude of change - are organized first, followed by the qualitative results from the semi-structured interview and participant observation. All numerical references are expressed according to the original scale of each instrument (*PAI-A*: T-scores; *Q-PAD*: percentiles).

Quantitative Results

Emotional Problems

- Body dissatisfaction. The distribution shifted toward higher values: the median went from p 79 to p 87, Q1 from 58 to 61 and Q3 from 92 to 94. However, the

interquartile range decreased from 34 to 33 and the Wilcoxon test was not significant ($p = 0.110$).

- Anxiety (PAI-A). There was a slight increase in the median (T 55 → 58) and Q3 (58 → 63), with widening of the upper range (72 → 75). The comparison did not reach significance ($p = 0.384$).
- Cognitive anxiety. Median stable (T 53), although the maximum value increased from 79 to 88 and the interquartile range from 12.5 to 15.5. Internal heterogeneity increased; however, $p = 0.819$ indicates no systematic change.
- Emotional anxiety. Median fixed at T 52; interquartile range narrowed (12 → 10.5), despite the minimum and maximum values moving away. $p = 0.244$.
- Physiological anxiety. The median (T 60) was maintained. The central range widened (interquartile range 10 → 12) and the quartiles moved up (53 → 55; 63 → 67). $p = 0.270$.
- Anxiety (Q-PAD). The median decreased from p 80 to p 74 and the interquartile range contracted (34 → 25.5). However, the change was not significant ($p = 0.796$).
- Depression (PAI-A). A reduction in the median (T 64 → 61) was observed. The interquartile range increased (9.5 → 12.5) due to the widening of the extremes (+10 and -9 T). $p = 0.706$.
- The cognitive, emotional and physiological subscales replicated this pattern: minor shifts in the central tendency and moderate expansion of the dispersion; $p > 0.50$ in all cases.
- Depression (Q-PAD). The median fell from p 90 to p 83 and the interquartile range increased from 20 to 27. The contrast was not significant ($p = 0.204$).
- Uncertainty about the future. There was a statistically significant improvement: median decreased from p 86 to p 71, interquartile range 20 → 27, $p = 0.011$, $g = -0.459$ (moderate magnitude). Sign test showed a concordant trend (17 ↓, 8 ↑; $p = 0.108$).
- Self-esteem and well-being. The median decreased from 26 to 19 and the dispersion contracted; however, $p = 0.098$ remained above the threshold.
- Somatic complaints. The median increased from 62 to 64, with an increase in the interquartile range (16.5 → 23.5); $p = 0.980$. The conversion, somatization and hypochondriasis subscales remained stable ($p > 0.30$).
- Schizophrenia. The global scale increased its median (T 67 → 70) and widened the interquartile range to 23; all subscales showed greater dispersions, with no significant differences ($p \geq 0.737$).
- Borderline features. Only "emotional instability" evidenced a median increase (T 52 → 56); "self-harm" regressed slightly. No subscale reached significance ($p \geq 0.271$).
- Suicidal ideations. The median decreased from 63 to 57; the upper whisker was extended (80 → 106). $p = 0.061$ (trend).
- Stress. Median reduction (62 → 56), with overall increase in dispersion; $p = 0.829$.
- Lack of social support. Second significant difference: median increased from 64 to 58; $p = 0.032$, $g = -0.454$. Sign test indicated a parallel pattern (17 ↓, 7 ↑; $p = 0.064$).

Behavioral Problems

- Problems with drugs (PAI-A) and Problems with alcohol (PAI-A). Both medians declined (Drug problems T 71 → 65; Alcohol problems 63 → 53), although only Drug problems showed a trend ($p = 0.066$). The Q-PAD "substance abuse" reflected a proportional regression ($p = 0.264$).

- Interpersonal problems (Q-PAD) and Family problems (Q-PAD). There were decreases in the median ($p = 0.375$ and 0.367 , respectively), accompanied by an increase in the interquartile range, without significance.
- Psychosocial risk. The median went from p 92 to p 84; $p = 0.687$.
- Antisocial traits. The main scale decreased (T 62 \rightarrow 58), with increasing interquartile range (12 \rightarrow 19); $p = 0.424$. None of the subscales reached significant values.
- Mania. Heterogeneous changes in dispersion were observed, with practically stable medians; $p \geq 0.503$.
- Paranoia. Slight increase in overall median (T 62 \rightarrow 65), with disparate results in the subscales; no comparison was significant ($p \geq 0.073$).
- Aggression. Only subscale with significant difference: aggressive attitude (AGR-A) rose from T 55 to 58; $p = 0.037$, $g = 0.280$ (small effect). Sign test revealed 16 \uparrow , 9 \downarrow ; $p = 0.690$.
- Refusal of treatment. The median decreased from T 52 to 47; $p = 0.187$, $g = -0.387$ (small-moderate effect).
- Disorders related to anxiety (PAI-A), dominance (PAI-A) and agreeableness (PAI-A). Minimal variations, no statistical significance ($p \geq 0.316$).

Spearman's Rank Correlations

Before the intervention, homonymous scales showed weak associations: anxiety, $r = 0.297$; depression, $r = -0.053$. After the application of Growing in Mindfulness (CEM), these correlations increased to $r = 0.495$ and $r = 0.326$, respectively, suggesting greater convergence of the instruments in symptomatic appreciation. The synonymous scales "drug problems/substance abuse" went from $r = 0.555$ to 0.609 . A clear increase was observed between "alcohol problems" and "substance abuse" ($r = 0.781$ post-intervention). In the case of anxiety, the cognitive subscale of the PAI-A raised its correlation with the Q-PAD from 0.305 to 0.593 . In depression, the emotional dimension rose from 0.123 to 0.517 . Taken together, these correlations suggest that, following the CEM intervention, adolescents' self-perceptions became more consistent between the two questionnaires.

Quantitative Synthesis

The results can be summarized in three central findings:

1. **Statistically significant improvements** in *uncertainty about the future* ($p = 0.011$; $g = -0.459$) and *lack of social support* ($p = 0.032$; $g = -0.454$), both with moderate magnitude and in a favorable direction (decrease). These improvements in both scales are shown in *Figures 1 and 2*, respectively.

Figure 1

Box-and-whisker plot for levels of uncertainty about the future as assessed by the Q-PAD before and after treatment

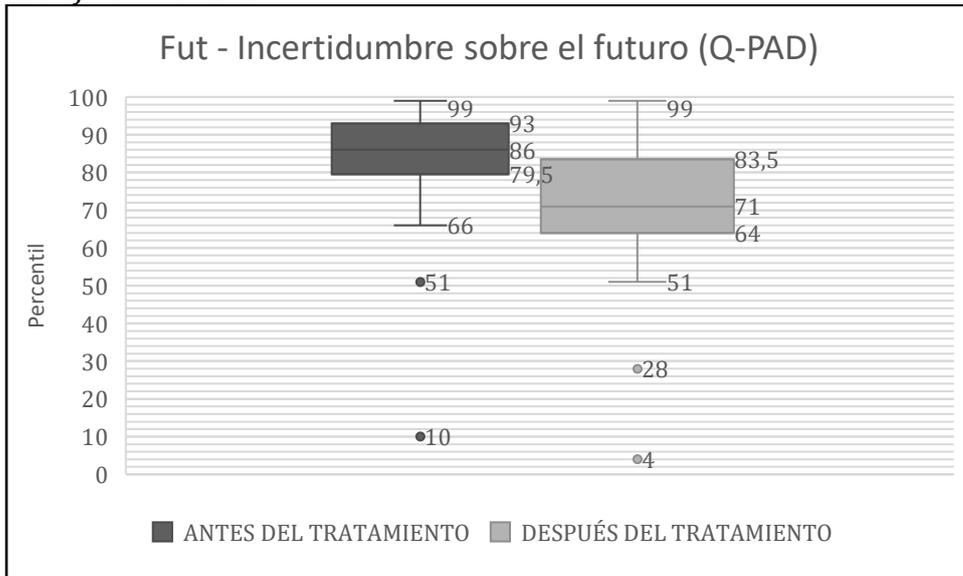
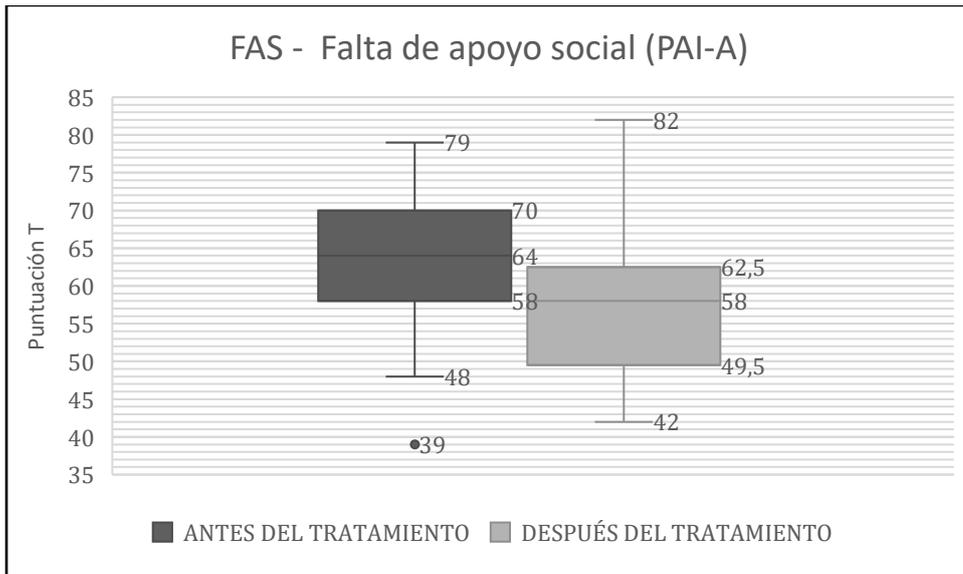


Figure 2

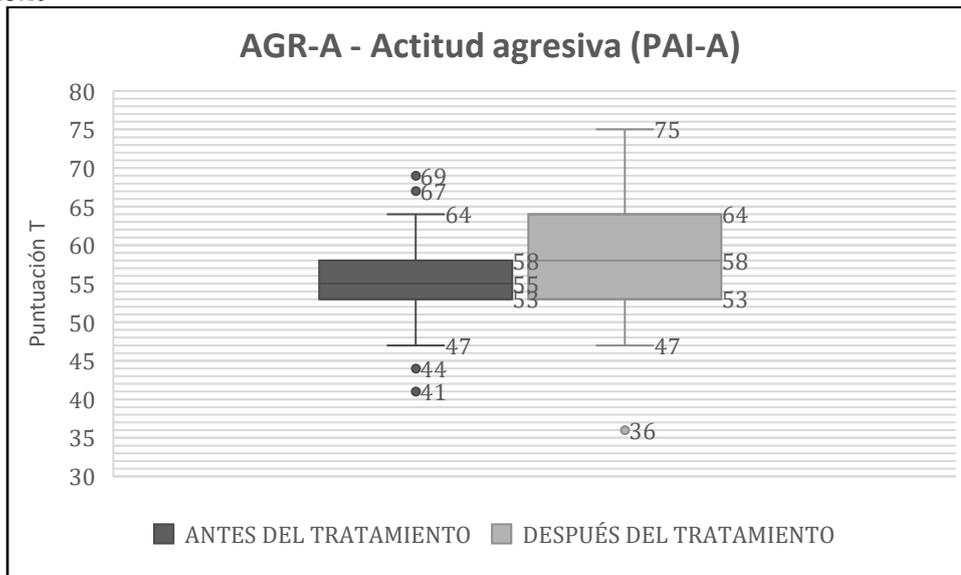
Box-and-whisker plot for levels of lack of social support assessed using the PAI-A before and after treatment.



2. **Significant worsening** in *aggressive attitude* ($p = 0.037$; $g = 0.280$), although with a small effect size. This increase in *aggressive attitude* is depicted in *Figure 3*.

Figure 3

Box-and-whisker plot for aggressive attitude levels assessed by the PAI-A before and after treatment



3. **Stability** in the rest of the dimensions, with non-significant fluctuations, despite slight decreases in *depression, stress* and *refusal of treatment*.

Qualitative Results

Strategies in the CPI "Jalteva"

Participant observation revealed the coexistence of two programmatic blocks:

- **Formal education** and **vocational workshops** (carpentry, welding, barbering, agriculture), aimed at job reinsertion.
- **Spiritual and leadership training**, provided by *Counteract International* through the *Success Academy*, which includes daily devotionals and baptism ceremonies.

These activities form an environment of rigid discipline, with a predominance of extrinsic reinforcers (rewards, penalty reduction) over intrinsic self-regulation strategies.

Director Interview (Essential Excerpts)

- The institutional objective is "reintegration with rigor"; young people are perceived as "resilient" in the initial phases.
- Quarterly L 5000 is available for materials, forcing staff to fund shortfalls.
- The technical team (psychologists, social workers, teachers) is "insufficient" to meet the demand.
- Mindfulness is recognized as "theoretically useful," although the director fears that it "gets confused with a game" and erodes discipline.
- Family intervention is limited: some households belong to criminal structures.
- Post-release follow-up lacks stable resources.

Integration of Qualitative Findings

The directive discourse helps to shed light on the poor improvement in internalized variables (anxiety, depression) and resistance to change in antisocial traits: attention is focused on obedience and productive occupation, while emotional exploration receives a lower priority. The reduction of *uncertainty about the future* coincides with the institutional emphasis on work and religious planning of the "life project". In turn, the increase in *aggressive attitudes* could be explained by the tension between the punitive model and the partial introduction of introspective techniques that, without adequate behavioral accompaniment, would have increased emotional awareness without providing effective regulatory strategies.

Table 1

Significant changes in Fut, FAS and AGR-A after intervention with CEM therapeutic game

Variable	Address	Median pre	Median post	wilcoxon's p	g of Hedges
Uncertainty about the future (Fut)	↓ significant	p 86	p 71	0.011	-0.459
Lack of social support (FAS)	↓ significant	T 64	T 58	0.032	-0.454
Aggressive attitude (AGR-A)	↑ significant	T 55	T 58	0.037	0.280

Based on quantitative data, the *Growing in Mindfulness* (CEM) therapeutic game produced statistically significant decreases in *uncertainty about the future* ($p = .011$; $g = -0.46$) and *lack of social support* ($p = .032$; $g = -0.45$), both with effect sizes of medium magnitude supporting clinically relevant improvement in these protective factors of adolescent resilience. In contrast, *aggressive attitude* showed a small but significant increase ($p = .037$; $g = 0.28$), suggesting a slight deterioration in this indicator. The rest of the internalized symptoms did not reach significant variations or clinical relevance. Qualitative evidence suggests that the disciplinary organization of the center, the scarcity of resources and the absence of specific therapeutic protocols limited the potential effectiveness of the playful-mindfulness component of the program.

Discussion and Conclusions

This section analyzes, integrates and contrasts the quantitative and qualitative findings of the study with previous literature, as well as the conclusions, limitations and implications derived from them. The main focus is to assess the extent to which the therapeutic game *Growing in Mindfulness* (CEM) succeeded in modifying the emotional and behavioral problems of adolescents at the "Jalteva" Pedagogical Internment Center, considering the institutional and sociocultural context in which it was implemented.

Interpretation of Quantitative Findings

Emotional Problems

The Q-PAD and PAI-A analyses show a selective impact of EMF. The *Uncertainty about the future* (86th percentile → 71; $p = .011$; $g = -0.459$) and *Lack of social support* (T 64 → 58; $p = .032$; $g = -0.454$) scales showed improvements of moderate magnitude. These declines suggest that mindfulness practices, even in a brief playful format, may promote goal clarification and perceived interpersonal support, critical factors for resilience and reintegration.

The rest of the emotional indicators remained stable. *Anxiety* (PAI-A: T 55; $p = .840$; Q-PAD: 80th percentile → 74; $p = .796$) and *Depression* (PAI-A: T 64 → 61; $p = .706$; Q-PAD: 90th percentile → 83; $p = .204$) did not experience clinically relevant declines. Similarly, *Body dissatisfaction*, *Self-esteem and well-being*, *Somatic complaints*, *Stress*, *Suicidal ideation* and psychotic symptoms grouped under *Schizophrenia* did not show significant variations. Everything indicates that four 50-minute sessions are insufficient to modulate highly complex and deep-rooted emotional constructs, which usually require intensive, multimodal and longer interventions.

As for *Borderline Traits*, none of the subscales (*Emotional Instability*, *Identity Disturbance*, *Problematic Relationships*, *Self-Aggressions*) showed improvements. The deeply relational nature of these traits limits the effectiveness of a brief group program that is neither explicitly oriented to interpersonal regulation nor endowed with dialectical-behavioral components.

Behavioral Problems

The behavioral results replicate the previous pattern: stabilities predominate and, in one particular case, a change contrary to expectations. On the *Substance Abuse/Drug Problems* scales (PAI-A: T 71 → 65; $p = .066$) and *Problems with alcohol* (T 63 → 53; $p = .317$) showed a downward trend that did not reach statistical significance. *Interpersonal problems*, *Family problems*, *Psychosocial risk* and *Antisocial traits* remain virtually unchanged.

The only statistically significant variation is detected in *Aggressive attitude* (T 55 → 58; $p = .037$; $g = 0.280$), with a slight increase. This finding suggests that the heightened emotional awareness induced by mindfulness may have amplified the expression of irritability in the absence of sufficient regulatory tools, especially in a strict disciplinary environment that does not facilitate positive catharsis of frustration. Neither *Verbal Aggressions* nor *Physical Aggressions* changed, so the increase appears to focus on internal disposition rather than observable behavior.

Interpretation of Qualitative Findings

The interview with the management of CPI "Jalteva" reveals five contextual factors that help explain the limited magnitude of the changes:

1. Predominance of disciplinary rigor. The institutional fear of "seeing everything as a game" restricts the flexible application of playful methodologies. Such rigidity hinders the internalization of mindfulness as an autonomous and self-regulating practice.
2. Priority use of religious and occupational resources. Although spiritual and craft activities provide containment, they do not address anxiety, depression or

aggression in a focused way, which is consistent with the low quantitative variation in these scales.

3. Financial constraint and overload of the technical team. Minimal budgets and reduced staffing levels impede prolonged implementation, ongoing clinical supervision and post-internment follow-up, recognized pillars for consolidating behavioral change.
4. Distrust towards mindfulness. Skepticism about its "seriousness" creates a cultural gap between the philosophy of mindfulness and the prevailing culture of control, hindering the adherence of facilitators and participants.
5. Adverse family environments. Reincorporation into violent and poor communities threatens the sustainability of progress, especially in variables such as *family problems* and *psychosocial risk*, which did not improve after the intervention.

Comparison with Previous Literature

In international evidence, mindfulness-based programs show small-moderate effects on anxiety and depression when they exceed six weeks and are complemented with cognitive-behavioral therapy. The absence of changes in the present investigation supports this premise: brevity and lack of cognitive components limit the scope. On the other hand, the decrease in *Uncertainty about the future* is consistent with studies linking mindfulness with tolerance for ambiguity and acceptance (Korte et al., 2022). Similarly, the improvement in *Perceived social support* replicates findings describing the buffering effect of mindfulness on isolation (Huang et al., 2022).

Increased *Aggressive Attitude* is less frequent in the literature, but has been documented in trauma populations when emotional awareness practice is not accompanied by training in impulse regulation skills (Ribeiro da Silva et al., 2020). This phenomenon underscores the need to integrate mindfulness with behavioral techniques.

Conclusions, Limitations and Implications

Conclusions

1. Partial effectiveness of CEM. The program reduced *uncertainty about the future* and *perceived lack of social support*, but did not modify *anxiety*, *depression*, *stress*, *antisocial traits* or *substance use*, and was associated with a slight increase in *aggressiveness*.
2. Insufficient duration and depth. Four brief group sessions are inadequate for complex emotional and behavioral disturbances; more extensive and multimodal programs are required.
3. Need for contextual adaptation. The effectiveness of mindfulness depends on its integration with the disciplinary culture of the CPI, the precariousness of resources and the socio-cultural reality of Honduras.
4. Centrality of social support and life project. The two significant improvements underscore the relevance of strengthening support networks and guiding future plans as the cornerstones of rehabilitation.
5. Methodological limitations. The pre-experimental design with no control group, small sample size and lack of follow-up restrict external validity and causal attribution.
6. Potential for institutional synergy. Integrating CEM into existing religious, educational and psychosocial routines could enhance its impact and promote restorative justice.

Limitations

- Absence of a control group that prevents isolation of the effect of EMF.
- Short duration and exclusively group format that reduce the therapeutic dose.
- Small and homogeneous sample (27 men), which limits generalization.
- Lack of longitudinal follow-up that prevents assessment of the permanence of the changes.
- Lack of standardized protocol that hinders replication.
- Shortage of resources and staff overload affecting the quality of implementation.

Implications

Future lines of research

- Quasi-experimental or experimental designs with control group.
- Longer interventions (≥ 8 weeks) and 6-12 month follow-up.
- Combine group and individual sessions to address trauma cases.
- Diversify the sample (gender, regions, community contexts).
- Develop a standardized and culturally validated EMF manual.
- Integrating mindfulness with CBT, DBT, family therapy and sport.
- Develop Latin American cross-cultural studies and in-depth qualitative analysis.

Practical Recommendations

1. Protocol the CEM with objectives, activities and evaluation criteria.
2. Extend the duration and frequency of sessions to consolidate skills.
3. Continuously train staff in mindfulness and trauma.
4. Culturally adapt materials and dynamics to the Honduran context.
5. Link the program with mental health services and community networks.
6. Involve families to reinforce extramural advances.
7. Evaluate periodically to adjust the plan in real time.
8. Manage alliances with NGOs and government agencies to sustain the intervention.

Social Relevance

- Humanizes juvenile justice by prioritizing self-regulation over punishment.
- Reduces recidivism by improving self-awareness and sense of support.
- It is accessible and low-cost, suitable for contexts with limited resources.
- Strengthens institutions such as INAMI by offering evidence-based programs.

Final Considerations

CEM demonstrated the ability to selectively improve the *perception of social support* and *certainty about the future*, essential aspects for resilience. However, it did not achieve broad changes in most emotional and behavioral problems, and was associated with a slight increase in *aggressive attitude*. These findings confirm that mindfulness, in a brief and isolated format, is not sufficient to address the biopsychosocial complexity of adolescents in conflict with the law. Future interventions should be combined with cognitive therapies, family components and follow-up plans, all framed in public policies that promote comprehensive, restorative and culturally relevant juvenile rehabilitation.

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Conflict of Interest

The authors declare that they have no conflicts of interest to declare.

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Psychometric properties of an instrument to measure the algebra proficiency of student teachers

Propiedades psicométricas de un instrumento para medir el dominio del álgebra de estudiantes en formación docente

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ABSTRACT

Keywords:

Teacher training, Evaluation instruments, Psychometrics.

This research is a continuation of the instrumental study that consisted of designing an instrument to measure the algebra proficiency (IMDA) of Mexican students in teacher training. The first stage included application of the Delphi method, expert judgment, content validity test using the Hernandez-Nieto coefficient and piloting with 79 undergraduate students in pedagogy, which resulted in a KR-20 alpha reliability coefficient of 0.89 and excellent content validity. The present study was carried out with the objective of finding out if the IMDA is prepared for a larger scale project and was verified through two ways: a) Determination of the psychometric properties of reliability and content validity; the first through the KR-20 alpha coefficient and the second through item quality; b) Measurement of variability through the regression model. The sample consisted of 333 undergraduate students in public institutions of higher education in the state of Durango, Mexico. The results indicated the following: a) Reliability of the KR-20 alpha with a value of 0.84 and acceptable values in the statistical mean of the difficulty index (MIdif=0.59) and discrimination index (MIdisc=0.31); b) The R-squared coefficient of determination indicated that the proportion of variability of the dependent variable is significantly explained by all the independent variables in the regression model. It is concluded that the IMDA is reliable and has validity to generalize results in measuring the algebra proficiency of students in teacher training.

RESUMO

Keywords:

formação de professores, Instrumentos de avaliação, Psicometria.

Esta investigação é uma continuação do estudo instrumental que consistiu na conceção de um instrumento para medir a proficiência em álgebra (IMDA) dos estudantes mexicanos em formação de professores. A primeira fase incluiu a aplicação do método Delphi, a opinião de peritos, o teste de validade de conteúdo utilizando o coeficiente de Hernandez-

Nieto e a pilotagem com 79 estudantes de licenciatura, o que resultou num coeficiente de fiabilidade alfa KR-20 de 0,89 e numa excelente validade de conteúdo. O presente estudo foi realizado com o objetivo de averiguar se o IMDA está preparado para um projeto de maior escala e foi verificado através de duas formas: a) Determinação das propriedades psicométricas de fiabilidade e validade de conteúdo, a primeira através do coeficiente alfa KR-20 e a segunda através da qualidade dos itens; b) Medição da variabilidade através do modelo de regressão. A amostra foi constituída por 333 estudantes de licenciatura de instituições públicas de ensino superior do estado de Durango, México. Os resultados indicaram o seguinte: a) Fiabilidade do alfa KR-20 com um valor de 0,84 e valores aceitáveis na média estatística do índice de dificuldade ($M_{dif}=0,59$) e do índice de discriminação ($M_{disc}=0,31$); b) O coeficiente de determinação R-quadrado indica que a proporção de variabilidade da variável dependente é significativamente explicada por todas as variáveis independentes no modelo de regressão. Conclui-se que o IMDA é fiável e tem validade para generalizar os seus resultados.

ABSTRACT

Palabras clave:

formación docente, Instrumentos de evaluación, Psicometría.

Esta investigación es continuidad al estudio de carácter instrumental que consistió en diseñar un instrumento para medir el dominio del álgebra (IMDA) de estudiantes mexicanos en formación docente. La primera etapa incluyó aplicación del método Delphi, jueceo de expertos, prueba de validez de contenido mediante el coeficiente de Hernández-Nieto y piloteo con 79 estudiantes de licenciatura en pedagogía, el resultado arrojó un coeficiente de fiabilidad del alfa KR-20 de 0.89 y excelente validez de contenido. El presente estudio se realizó con el objetivo de conocer si el IMDA está preparado para un proyecto de mayor escala y se verificó mediante dos vías: a) Determinación de las propiedades psicométricas de fiabilidad y validez de contenido; la primera mediante el coeficiente alfa KR-20 y la segunda a través de la calidad del ítem; b) Medida de variabilidad a través del modelo de regresión. La muestra estuvo constituida por 333 estudiantes de licenciatura de instituciones públicas de educación superior del estado de Durango, México. Los resultados indicaron lo siguiente: a) Fiabilidad del alfa KR-20 con un valor de 0.84 y valores aceptables en la media estadística del índice de dificultad ($M_{dif}=0.59$) e índice de discriminación ($M_{disc}=0.31$); b) El coeficiente de determinación R-cuadrado indicó que la proporción de variabilidad de la variable dependiente es explicada de manera significativa por todas las variables independientes del modelo de regresión. Se concluye que el IMDA es fiable y tiene validez para generalizar sus resultados.

Introduction

Mathematical thinking involves the development of mathematical activities related to counting, measurement, representation, inference and modeling Rodríguez-Álvarez and Duran-Llaro (2023), the result of these activities has an impact on the development of the individual, so it is important that future teachers develop knowledge and ability to analyze and propose practices that favor the learning of mathematics and the development of mathematical thinking in students, aspects where the use of algebra is fundamental.

In general, mathematical practice refers to mathematical creation and/or production and consists of promoting the knowledge of formal mathematical language and its application, since according to Bueno and Vivanco (2023), formal languages are important tools for inference and discovery, fundamental aspects that can allow mathematical demonstrations to be carried out in teaching practice at any educational level.

The process for the development of mathematical thinking and the application of mathematics starts from preschool education, where the use of mathematical language is relevant, even if it is not developed in a formal way, however, the learning that is achieved will be fundamental for primary education to address the use and understanding of mathematical symbols correctly, this idea is shared by Alsina (2015), who argues that at this educational level mathematical demonstrations cannot be performed but points out the importance of performing simple proofs

The student in the process of teacher training should have mastery of early algebra as a means to favor algebraic thinking in the first grades of elementary education (Pinto et al., 2023), the fact of recognizing this thinking as a way of thinking and operating with objects, relations and mathematical structures, facilitates the student to understand and find meaning in mathematics. The practice of early algebra is facilitated if it is promoted through real situations, in which there is room for reasoning and argumentation in a way that leads them to understand mathematical properties, the identification of patterns and the representation of relationships, aspects that allow children to make generalizations (Pincheira and Alsina, 2021).

The algebraic content in the subject of mathematics in secondary education corresponds to the thematic axis number, algebra and variation, specifically in the academic content of addition and subtraction of algebraic expressions; this academic content begins to be handled in the first year of secondary school and has transcendence in the following school cycles.

The teaching of algebra in secondary education is fundamental for the academic and personal development of students; this discipline provides essential tools to solve mathematical problems, fosters critical thinking and logic, skills necessary in everyday life and in their training process (Aguirre and Cerati, 2020). The mastery of algebra is a tool that serves students to improve their academic performance and a basis for further studies in science, technology, engineering and mathematics, therefore, understanding the importance of teaching algebra at this stage is important to form competent and analytical citizens.

In secondary education it is common to perform formal and non-formal mathematical demonstrations, these include processes of identification and analysis of errors in the use of algebra, especially those related to the acquisition of algebraic language and the transition from arithmetic to algebra (Avila, 2016).

At the upper secondary education level, formal demonstrations are generalized and this educational space is a crucial point for the development of algebra because to a

greater or lesser extent, this area of the exact sciences is relevant and has competence in the professional world (Márquez, 2019), since it is undeniable that there is a close correlation between technological development in a society and the involvement of mathematics.

It is at this educational level where mathematics acquires greater preponderance (Universidad Europea, 2023), because it is there where the processes for entrance selection, as well as those for selection for higher education studies, become formal, due to the fact that this subject is part of the curricula in a wide variety of undergraduate careers.

The study of mathematics in higher education institutions training teachers is relevant, because students must acquire tools to promote the development of their mathematical ability and facilitate problem solving, in this same sense, Aké (2019), argues that teacher training should incorporate the study of situations that allow rethinking arithmetic notations and operations in a different way than the typical; that is, cultivate a new way of arithmetic thinking in which the basic notions of algebra can be built.

The enrollment of teacher training institutions is composed of students who completed their high school studies in technical or humanistic schools, regardless of the type and modality of secondary education received. These students should have a good command of algebra; however, in practice it has been shown that a considerable number of these students have problems with knowledge and application in this area of mathematics (Craveri, 2009).

To address this problem, it is convenient to carry out a diagnostic evaluation of students in order to know their level of mastery of algebra. This implies carrying out systematic and reflective processes to obtain quantitative and qualitative information on student learning, a situation that can be achieved through the application of various instruments, among them, exams in their different types and modalities.

Regardless of the educational level, learning algebra is important for the personal development of schoolchildren, because the appropriation of the necessary knowledge in the field of mathematics is fundamental for the student to achieve an intellectual and integral development that is reflected in their daily academic and daily life.

In this regard, it is worth mentioning that basic education teachers are the first promoters of learning and application of mathematical content, therefore, it is important that in their training process they become professional in this area of knowledge since teacher training institutions recognize the need and importance of strengthening the development of mathematics to help future teachers acquire skills that will allow them to guide their students in learning this discipline (Pérez, 2022).

In the teaching-learning process in the various disciplines or training fields, the teacher promotes evaluation activities, either to promote the improvement of learning or for accreditation purposes, in this regard, it is recognized that students present deficiencies that originate in their teacher training process; for this reason, it is convenient to address the suggestion of Pires (2024), who expresses the need for educational institutions and policy makers to prioritize the offer of specific courses and workshops to improve the evaluation skills of teachers.

In general, the teacher emphasizes an evaluation process for the achievement of learning, this implies carrying out systematic and reflective processes of obtaining quantitative and qualitative information about student learning (Hamodi et al., 2015), an educational action that can be achieved through the application of various instruments, among them, exams in their different types and modalities.

The information recovered through the previously mentioned evaluation instruments should be analyzed with methodological rigor to identify strengths and

barriers that students face at the beginning, during and at the end of an educational process, in order to guide their improvement. In this sense, the authors Sepúlveda-Obreque et al. (2017), state the need to promote the improvement and training of teachers on issues related to the assessment of learning and performance, as well as the application of instruments and their subsequent analysis to assess mastery in the field of mathematics and development of mathematical thinking in students and teachers.

In accordance with the above appreciations, this research work is the continuity of a study that, in the first part, consisted of designing an Instrument to Measure Algebra Proficiency [IMDA] (Ochoa and Rivera, 2024) and was aimed at Mexican students in teacher training. The IMDA construction process went through the stages of the Delphi method and expert judgment, content validity testing by means of the Hernandez-Nieto coefficient (Hernandez-Nieto, 2002), and a pilot test with 79 undergraduate students in pedagogy, a process that registered a reliability coefficient of Kuder Richardson's alpha 20 with a value of 0.89.

The second part of the study that occupies the present investigation, was carried out with the general objective of knowing if the IMDA is prepared for a larger scale project, this situation was verified through two ways: a) Determination of the psychometric properties of reliability and content validity, the first through the Kuder-Richarson alpha 20 coefficient and the second through the quality of the item and; b) Measurement of variability through the application of the Multiple Linear Regression method.

Method

This research was conducted based on the quantitative methodological approach with an instrumental design. According to Montero and León (2007), the study is considered instrumental in nature, given that the study consisted of determining the psychometric properties of the IMDA.

Sample and Participants

The total sample consisted of 333 students in teacher training who were currently pursuing their undergraduate studies in various public institutions of higher education in the state of Durango, Mexico. The selection of participants was non-probabilistic (Otzen, and Manterola, 2017). The sample size was determined according to the criteria set forth by Roco et al. (2021), which consists of having a minimum of five and a maximum of 10 subjects per item, an ideal number for the application of an improved instrument.

Instrument and Validation Process

In the first part of the study, the design of the IMDA was composed of 30 items distributed in five dimensions (García et al. 2019), with the following structure: a) Dimension 1; Moving from Arithmetic to Algebra (PAA), with six items; b) Dimension 2; Reversibility of Thought (RP), with six items; c) Dimension 3; Identifying Patterns (IP), with six items; d) Dimension 4; Generalization of Knowledge (GC), with six items and; e) Dimension 5; Abstraction and Reflection in Mathematical Processes (ARPM), with six items. IMDA are located in the Annexes section (see Annex 1).

Data Analysis

The data processed in the research process were organized and classified with the use of the Excel spreadsheet and analyzed with the support of the SPSS statistical program. The tests performed with the results of the IMDA application were the following: measures of central tendency, reliability test, item quality test and variability test by means of the multiple linear regression model.

Measures of Central Tendency

The measures of central tendency used in the analysis were the score obtained in each dimension of the IMDA and the total score.

Reliability Test

The reliability of the instrument was calculated using the Kuder-Richardson coefficient, specifically the KR20 formula, because it is a method used to evaluate the internal consistency of a measure based on dichotomous data. The calculation to determine this psychometric property is a formula that considers the variance of the item scores and is the dichotomous equivalent of the alpha coefficient (López et al., 2019).

Item Quality Test

The quality of an item was measured based on the value of its difficulty index and discrimination index, these statistics are closely related, however, it is important to note the special effect of the discrimination index, because according to the statement of Hurtado (2018), the determination of the norm value of discrimination influences the interpretation of the quality of the performance test. To determine the value of the item difficulty and discrimination index, the method used by Backhoff and Rosas (2000) was used; Table 1 shows the range of values of the difficulty and discrimination index to interpret the quality of the item.

Table 1

Classification and interpretation of difficulty and discrimination indexes

<i>Difficulty index</i>		<i>Discrimination index</i>		<i>Recommendation</i>
Ranking of the item	Index value	Ranking of the item	Index value	
Easy	0,91-1	Lousy	< 0,01	Discard
Relatively easy	0,81-0,90	Poor	0 a 0,19	Discard or revise
Adequate difficulty	0,51-0,80	Regular	0,20 a 0,29	Check
Relatively difficult	0,40-0,50	Good	0,30 a 0,39	Possibility to improve
Difficult	0-0,39	Excellent	0,40 a 1	Preserve

IMDA Variability Measure

The regression model was used to determine the variability of the score of the dependent variable with respect to the value of its statistical mean, and to evaluate whether this variability is significantly explained by the independent variables that intervened in the model

The regression model outputs as the main evaluator of variability the coefficient of determination R^2 (Rodríguez and Salmerón, 2018). The variables that intervened in the process were the total score and the score per dimension obtained by the participants in the response to the IMDA, for the purpose of the operational work in the SPSS statistical program, these were coded as follows:

- 1) Score obtained by the participants in the response to the IMDA (P_{IMDA}). According to the regression model, this variable corresponds to the dependent variable or response variable.
- 2) The scores obtained by the participants in each of the IMDA dimensions were: a) *Passage from Arithmetic to Algebra* (P_{PAA}); b) *Thought Reversibility Score* (P_{RP}); c) *Pattern Identification Score* (P_{IP}); d) *Generalization of Knowledge Score* (P_{GC}) and; e) *Abstraction and Reflection in Mathematical Processes Score* (P_{ARPM}). According to the regression model, these variables correspond to the independent variables or predictor variables.

To determine the dependence and relationship between these variables, the regression analysis was performed based on the following regression model.

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_ix_i$$

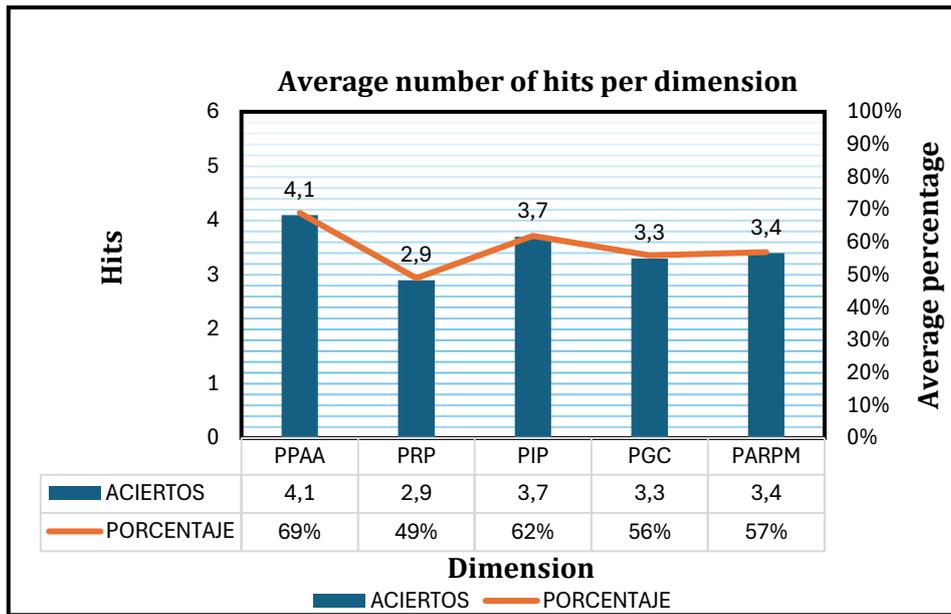
Results

Measures of Central Tendency

The graph in Figure 1 shows the value of the statistical mean of hits recorded in each dimension of the IMDA, here it can be seen that there is a balanced score between dimensions, which is confirmed with reference to the value of the mean of the statistical means of hits ($M_{DIMENSIONS}=3.5$)

Figure 1

Average number of hits by IMDA dimension



The score obtained by the participants in the response to the IMDA (P_{IMDA}) can be found in the annexes section (see annex 1), in these data is the value of the statistic of the mean of the P_{IMDA} score ($M_{IMDA}=17$ hits), this value indicates that, on average, the 333 students obtained 17 hits in the response to the 30 items of the IMDA.

Reliability measurement

The result of the reliability measure is shown in Table 2, the calculation was made through the Kuder-Richardson alpha 20 formula, according to Duran and Abad (2021), the value of the coefficient ($KR-20=.846$) is good, since the authors consider it acceptable when it is between .75 and .90.

Table 2

Reliability test result

Reliability statistics	
Alpha 20 of Kuder-Richardson	N of elements
.846	30

Content Validity of IMDA

Item Quality

Table 3 shows the value of the difficulty index and discrimination index of each item, where it is observed that the 30 items are considered of acceptable quality since they were located within the pre-established range of quality, likewise, it can be seen that the value of the statistical mean of the difficulty index ($M_{dif} = .59$) is recognized with an

adequate difficulty and the value of the statistical mean of the discrimination index ($M_{disc} = .31$) is recognized as good, both with the possibility of being improved.

Table 3
Difficulty and discrimination indexes

item	Idif	Idisc	item	Idif	Idisc	item	Idif	Idisc
1	0.49	0.31	11	0.48	0.33	21	0.52	0.35
2	0.68	0.38	12	0.52	0.38	22	0.61	0.36
3	0.77	0.26	13	0.59	0.38	23	0.50	0.24
4	0.70	0.27	14	0.43	0.40	24	0.59	0.30
5	0.77	0.27	15	0.63	0.34	25	0.64	0.33
6	0.72	0.34	16	0.70	0.26	26	0.61	0.31
7	0.44	0.37	17	0.60	0.22	27	0.47	0.43
8	0.63	0.34	18	0.78	0.29	28	0.41	0.21
9	0.49	0.36	19	0.66	0.20	29	0.59	0.21
10	0.38	0.35	20	0.47	0.22	30	0.69	0.31
							$M_{Idif}=.59$	$M_{Idisc}=.31$

Variability Test

Table 4 shows the summary of the regression model; the value of the R-squared determination coefficient of model 1 indicates that the variability of the independent variable P_{IP} explains 64.2% of the variability of the dependent variable P_{IMDA} . In the subsequent models, the value of the R-squared coefficient of determination increases with the progressive incorporation of the independent variables P_{PAA} , P_{ARPM} , P_{GC} , and P_{RP} , until it indicates that the explained variability provided by the scores covers practically 100% of the variability of the P_{IMDA} score. The explanation of variability offered by all the variables is important, as shown by the value of the Fisher-Snedecor (F) change statistic, whose value in each model is acceptable and with a significant “p” value.

Table 4
Summary of the model

Summary of the model							
Model	R	R square	Adjusted R-squared	Standard error of the estimate	gl	F	Sig.
1	,801 ^a	,642	,641	3,695	331	593,499	,000
2	,908 ^b	,824	,823	2,594	330	773,031	,000
3	,951 ^c	,905	,904	1,914	329	1038,982	,000
4	,977 ^d	,955	,955	1,315	328	1742,881	,000
5	1,000 ^e	1,000	1,000	,000	.	.	.

a. Predictors: (Constant), P_{IP}
 b. Predictors: (Constant), P_{IP} , P_{PAA}
 c. Predictors: (Constant), P_{IP} , P_{PAA} , P_{ARPM}
 d. Predictors: (Constant), P_{IP} , P_{PAA} , P_{ARPM} , P_{GC}
 e. Predictors: (Constant), P_{IP} , P_{PAA} , P_{ARPM} , P_{GC} , P_{RP}

A complementary result to the R-squared coefficient of determination test is the diagnosis of collinearity Salmerón and Rodríguez (2017). Table 5 shows that, in each regression model, the collinearity statistic *Tolerance* yielded values close to “1”; these

values are indicative of low collinearity between the independent variables, a result that reaffirms its effect on the regression model.

Table 5
Collinearity statistics

		Excluded variables ^a				
Model		In beta	t	Sig.	Partial correlation	Collinearity statistics Tolerance
1	P _{PAA}	,483 ^b	18,485	,000	,713	,781
	P _{RP}	,502 ^b	17,176	,000	,687	,671
	P _{GC}	,400 ^b	12,750	,000	,574	,738
2	P _{ARPM}	,466 ^b	16,501	,000	,672	,747
	P _{RP}	,350 ^c	14,631	,000	,628	,565
	P _{GC}	,316 ^c	14,918	,000	,635	,710
3	P _{ARPM}	,345 ^c	16,648	,000	,676	,674
	P _{RP}	,299 ^d	18,787	,000	,720	,552
	P _{GC}	,270 ^d	19,207	,000	,728	,693
4	P _{RP}	,286 ^e	.	.	1,000	,551

Another indicator of absence of collinearity between the scores of the independent variables is the existence of moderate correlation and absence of high correlation between pairs, Table 8 shows that the correlation values between pairs oscillate in the range of values ($.386 < r < .574$), i.e., the condition that demonstrates absence of collinearity established by Goode-Romero (2019) is met, and consists of excluding pairs of variables that indicate a correlation coefficient ($r > 0.6$).

Table 6
Correlation between pairs of variables

		Correlations				
		P _{PAA}	P _{RP}	P _{IP}	P _{GC}	P _{ARPM}
P _{PAA}	Pearson correlation	1	,556**	,468**	,386**	,473**
	Sig. (bilateral)		,000	,000	,000	,000
	N	333	333	333	333	333
P _{RP}	Pearson correlation	,556**	1	,574**	,392**	,471**
	Sig. (bilateral)	,000		,000	,000	,000
	N	333	333	333	333	333
P _{IP}	Pearson correlation	,468**	,574**	1	,512**	,503**
	Sig. (bilateral)	,000	,000		,000	,000
	N	333	333	333	333	333
P _{GC}	Pearson correlation	,386**	,392**	,512**	1	,411**
	Sig. (bilateral)	,000	,000	,000		,000
	N	333	333	333	333	333
P _{ARPM}	Pearson correlation	,473**	,471**	,503**	,411**	1
	Sig. (bilateral)	,000	,000	,000	,000	
	N	333	333	333	333	333

Discussion and Conclusions

Regarding the result of the application of the IMDA, the measures of central tendency indicated that there is a balance between the value of the statistical mean of the five dimensions the statistical mean value of the mean scores of the five dimensions, a

situation that reflects homogeneity in the response to the IMDA and is indicative of an adequate measure of the *algebra mastery construct*.

With attention to the objective of this research, the IMDA was applied to 333 students in teacher training and it was found that the reliability statistic continues to indicate a fairly acceptable value ($KR-20=.84$), only five hundredths below the value obtained in the pilot test ($KR-20=.89$); this result confirms that there is a good internal consistency between items and stability over time of the IMDA.

In relation to the item quality measure, it was found that each of the 30 items registered acceptable values in their difficulty and discrimination indexes, since they were located within the range established to be considered of good quality; the same occurred with the set of items that registered acceptable values in the statistical mean of their difficulty index ($M_{dif}=.59$) and in the statistical mean of their discrimination index ($M_{dif}=.31$); these results indicate that, in general, the IMDA items are moderately simple and that they differentiate between those who have and those who do not have a good command of algebra.

The variability test performed through the regression model indicated that the variability of the dependent variable was significantly explained by each of the independent variables up to 100%. This result was supported by the value of the R-squared coefficient of determination recorded in each model, which is shown in the summary of the regression model. These results indicate that the observed variability of the IMDA is systematic or random, a characteristic that contributes to obtaining reliable and consistent information, for the particular case, on the measure of algebra proficiency of students in teacher training.

A result that complements the IMDA variability measure is the *Tolerance* collinearity diagnosis, which yielded values close to "1." The value of this statistic indicates low collinearity among the independent variables in the regression model. This means that the variables are not strongly correlated with each other and that each independent variable provides unique information on the dependent variable; consequently, the regression model is more stable and the coefficients are more reliable, characteristics that improve the accuracy of the IMDA estimates. In support of the result of the collinearity test, a correlation test was performed between pairs of independent variables and a moderate positive correlation was found in each of them.

Once the IMDA was subjected to rigorous studies with a larger number of participants, it was confirmed that it has psychometric properties of reliability and content validity, in addition, the results of the variability test indicated that the IMDA also has the capacity to detect significant differences between individuals or groups.

These psychometric properties and characteristics exhibited by the IMDA increase its robustness and generalization of the results, guaranteeing that the instrument is accurate and useful to be applied in teacher training populations where students with a wide diversity in the mastery of algebra converge, since, at the undergraduate level, students who studied their baccalaureate in technical and humanistic schools attend.

With the application of the IMDA, we expect to obtain a diagnostic evaluation that will allow us to undertake actions focused on strengthening the development of mathematical thinking of students in teacher training, so that, when they are integrated into their educational practice, they will have more and better tools to facilitate the learning and educational practice of their students in this area of knowledge.

With the purpose of extending the usefulness of the IMDA, it remains to be tested in populations of different educational levels, since the structure and level of complexity of the items were carefully designed. On the other hand, there is also the concern of testing

the test to determine if it has predictive validity, a psychometric property through which the success of students can be predicted.

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Annexes

Annex 1

IMDA score (P_{IMDA})

P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A	P	A
1	30	37	26	73	23	109	21	145	18	181	16	217	14	253	12	289	11	325	9
2	30	38	26	74	23	110	21	146	18	182	16	218	14	254	12	290	11	326	8
3	30	39	26	75	23	111	21	147	18	183	16	219	14	255	12	291	11	327	8
4	30	40	26	76	23	112	20	148	17	184	16	220	14	256	12	292	11	328	8
5	30	41	26	77	23	113	20	149	17	185	16	221	14	257	12	293	10	329	8
6	30	42	26	78	23	114	20	150	17	186	16	222	14	258	12	294	10	330	8
7	30	43	26	79	23	115	20	151	17	187	15	223	14	259	12	295	10	331	8
8	29	44	26	80	23	116	20	152	17	188	15	224	14	260	12	296	10	332	8
9	29	45	26	81	23	117	20	153	17	189	15	225	14	261	12	297	10	333	7
10	29	46	26	82	23	118	20	154	17	190	15	226	14	262	12	298	10		
11	29	47	26	83	23	119	20	155	17	191	15	227	13	263	12	299	10	<u>$M_{IMDA}=17$</u>	
12	29	48	26	84	23	120	20	156	17	192	15	228	13	264	12	300	10		
13	29	49	25	85	22	121	20	157	17	193	15	229	13	265	11	301	10		
14	29	50	25	86	22	122	20	158	17	194	15	230	13	266	11	302	10		
15	29	51	25	87	22	123	19	159	17	195	15	231	13	267	11	303	10		
16	29	52	25	88	22	124	19	160	17	196	15	232	13	268	11	304	10		
17	29	53	25	89	22	125	19	161	17	197	15	233	13	269	11	305	10		
18	29	54	25	90	22	126	19	162	17	198	15	234	13	270	11	306	10		
19	28	55	25	91	22	127	19	163	17	199	15	235	13	271	11	307	10		
20	28	56	25	92	22	128	19	164	17	200	15	236	13	272	11	308	10		
21	28	57	25	93	22	129	19	165	17	201	15	237	13	273	11	309	10		
22	28	58	25	94	22	130	19	166	16	202	15	238	13	274	11	310	10		
23	28	59	25	95	22	131	19	167	16	203	15	239	13	275	11	311	10		
24	28	60	25	96	22	132	19	168	16	204	15	240	13	276	11	312	10		
25	28	61	24	97	22	133	19	169	16	205	15	241	13	277	11	313	10		
26	28	62	24	98	22	134	19	170	16	206	15	242	13	278	11	314	10		
27	27	63	24	99	21	135	19	171	16	207	14	243	12	279	11	315	10		
28	27	64	24	100	21	136	19	172	16	208	14	244	12	280	11	316	10		
29	27	65	24	101	21	137	18	173	16	209	14	245	12	281	11	317	10		
30	27	66	24	102	21	138	18	174	16	210	14	246	12	282	11	318	9		
31	27	67	24	103	21	139	18	175	16	211	14	247	12	283	11	319	9		
32	27	68	24	104	21	140	18	176	16	212	14	248	12	284	11	320	9		
33	27	69	24	105	21	141	18	177	16	213	14	249	12	285	11	321	9		
34	27	70	24	106	21	142	18	178	16	214	14	250	12	286	11	322	9		
35	27	71	23	107	21	143	18	179	16	215	14	251	12	287	11	323	9		
36	27	72	23	108	21	144	18	180	16	216	14	252	12	288	11	324	9		

Annex 2

IMDA instrument

Items No	Item
1-6 (PAA)	Determine the result of the algebraic expression: $2x + 3y =$ (for $x = 1$; $y = -2$)
	Determine the result of the algebraic expression: $3a - 2b =$ (for $a = \frac{3}{5}$; $b = \frac{1}{10}$)
	Indicate the value of "x" in the algebraic expression: $x = 8 + y$; consider that: $y = 4$
	The value of "x" in the algebraic expression is searched: $8x - 8 = 6$.
	Indicate the value of "x" to achieve equality in the following algebraic operation: $-11 + 7 = x - 6$
7-12 (RP)	State the equivalent of the following algebraic expression: $4(x - 2) + 6 =$
	Indicate the number that satisfies the equality: $(a)(b + c) = (ab + ac)$
	Indicate the value of "x" in the following algebraic operation: $\frac{3x}{4} - 12 = 0$
	Equality: $r^4 = 256$ Which expression determines the value of "r"?
	Indicate the result of the algebraic sum: $4x(y - 4xy) + 12x^2y =$
13-18 (IP)	Indicate the factors corresponding to the square trinomial: $x^2 - 3x - 18$
	State the solutions to the system of simultaneous equations: $(2x + 4y = 28)$; $(-4x + 2y = -6)$
	State the term in the fifth position of the following geometric progression: $3, 9, 27, \dots, (\dots)$,
	Indicate the pattern of the following geometric progression: $7, 11, 15, 19, \dots$
	The sum of 6 consecutive numbers is 45. what should be the range of these numbers?
19-24 (GC)	what is the sum of the first 5 terms of the arithmetic progression: $15, 13, 11, \dots, \dots?$
	To which geometric progression does the pattern correspond: $3n^2 - 2$
	Which monomial fits in the fifth position of the geometric progression: $2xy, 4xy^2, 8xy^3, \dots, (\dots)?$
	State the equality that provides the solution to a direct proportion problem.
	State the equality that provides the solution to the inverse proportion problem.
25-30 (ARPM)	From the formula $R = \frac{V}{I}$, give the appropriate equation to calculate the value of (I).
	Derived from the formula: $x = \frac{4}{(y+z)}$, indicate the appropriate equation for calculating the value of "y".
	From the formula $^{\circ}C = \frac{^{\circ}F - 32}{1.8}$; give the equation to obtain the temperature at $^{\circ}F$
	State the formula to obtain the value of the height (h) of a trapezoid: $A = \frac{(B+b)h}{2}$
	Write the mathematical model to represent: Maria's (M) money plus one-fourth of Lupe's (L) money
25-30 (ARPM)	Write the mathematical model to represent: Luis (L) has 8 coins less than Paco (P)
	Write the mathematical model to represent: Juan has 15 coins more than Pedro
	Write the mathematical model to represent: writer "B" wrote 2.5 times more pages than "A"
	Write the mathematical model to represent: There are 27 students in a group and twice as many females (M) as males (M).
	Write the mathematical model for obtaining an odd number

Psychological Factors in driving: Analysis of the Relationship between Attributional Styles and Risk Behaviors

Factores Psicológicos en la Conducción: Análisis de la Relación entre Estilos Atribucionales y Conductas de Riesgo

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ABSTRACT

Keywords:

causal attribution, locus of control, risk behaviors, driving behavior.

Traffic accidents comprise one of the main causes of mortality and economic damage worldwide. Driving is a complex behavior influenced by cognitive and behavioral factors that play a significant role in the occurrence of accidents and violations, often due to risky behaviors. The objective of this research is to analyze the relationship between the dimensions of causal attribution (locus of control, controllability and stability) and aberrant behaviors (violations, aggressive violations, errors and lapses) in driving. To this end, a sample of 42 drivers (13 men and 28 women) completed a series of self-reported measures. The results revealed a positive association between internal locus of control and stability with a higher prevalence of aggressive behaviors. Likewise, a negative association was found between the perception of controllability and risk behaviors, suggesting that a greater perception of control decreases the probability of presenting risk behaviors. These findings highlight the role of attributional styles in predicting risky driving behaviors, which has important implications for the promotion of road safety and the design of preventive interventions.

RESUMEN

Palabras clave:

atribución causal, locus de control, conductas de riesgo, comportamiento en la conducción.

Los accidentes de tráfico comprenden una de las principales causas de mortalidad y daños económicos a nivel mundial. La conducción es una conducta compleja influenciada por factores cognitivos y conductuales que desempeñan un papel significativo en la ocurrencia de accidentes e infracciones, a menudo debidos a conductas de riesgo. La presente investigación tiene como objetivo analizar la relación entre las

dimensiones de atribución causal (locus de control, controlabilidad y estabilidad) y las conductas aberrantes (violaciones, violaciones agresivas, errores y lapsus) en la conducción. Para ello, una muestra de 42 conductores (13 hombres y 28 mujeres) completó una serie de medidas autoinformadas. Los resultados revelaron una asociación positiva entre el locus de control interno y la estabilidad con una mayor prevalencia de conductas agresivas. Asimismo, se encontró una asociación negativa entre la percepción de controlabilidad y las conductas de riesgo, sugiriendo que una mayor percepción de control disminuye la probabilidad de presentar conductas de riesgo. Estos hallazgos subrayan el papel de los estilos atribucionales en la predicción de comportamientos de riesgo en la conducción, lo cual tiene importantes implicaciones para la promoción de la seguridad vial y el diseño de intervenciones preventivas.

Introduction

Nowadays, transportation has become one of the main characteristics of a country's economy and development, but it also represents one of the main challenges faced by cities due to population growth and the complexity of modern societies (Mardanian and Bahari, 2024). In this context, road traffic crashes constitute one of the leading causes of mortality and economic damage, especially in middle-income and developing countries (Rejali et al., 2023). In addition, the continued increase in vehicles has exacerbated road safety problems, generating annual costs estimated at around US\$518 billion globally due to accidents and an estimated 1.19 million deaths due to traffic accidents in 2023 around the world (WHO, 2023). Given the seriousness of this problem, understanding the causes behind traffic accidents is essential to mitigate their negative consequences and strengthen road safety. To this end, it is necessary to analyze driving not only as a mechanical process but as a complex behavior influenced by various behavioral and psychological factors.

Driving involves multiple cognitive and emotional processes that can influence the driver's decision making and behavior. Many authors have proposed theoretical models to help conceptualize these factors, which have commonly given little weight to driver beliefs and self-control behaviors (Gosselin et al., 2010). Furthermore, compared to research that has remarked on structural factors such as road engineering or technical vehicle conditions, there is very little research concerning the role of human factors (Alavi et al., 2017). In this line, one of the emotions that has been most investigated is anger, mainly because it is a shared and frequently experienced experience among drivers (Herrero-Fernández, 2011). Anger in research has been associated with traffic rule violation (Gaianu et al., 2020; González-Iglesias et al., 2012; Stephens et al., 2021) and with the production of risky driving behaviors (Failde-Garrido et al., 2023; Liu et al., 2021) and its detrimental effect on certain cognitive functions (Yu et al., 2022). Therefore, anger should be studied and conceptualized, not only as an emotional experience, but also as an expression related to aggression and risk behaviors in drivers (Deffenbacher et al., 2016; Zhang et al., 2019); although this relationship is not entirely clear (Herrero-Fernandez, 2013). Thus, we find research that concludes that anger does not always trigger an aggressive response (Baron and Richardson, 1994) and, on the other hand, research that has found a positive correlation between anger as a trait and its subsequent expression (Dahlen and Ragan, 2004). The expression of driving aggressiveness and other variables such as sensation seeking or impulsivity can lead to risky behaviors that increase the probability of being involved in accidents (Deffenbacher et al., 2000; Liu et al., 2021; Yu et al., 2022). Such risky driving behaviors include excessive speeding, driving too close to another vehicle, and driving under the influence of psychoactive substances (Harre and Sibley, 2007).

However, human factors have received relatively little attention despite their relevance in accident prediction. This highlights the importance of the role of risky behaviors as a cause of traffic accidents and, therefore, the importance of conducting studies to fill the gap in the scientific literature. In conceptualizing the possible causes of traffic accidents, it is important to note that the term "human error" by itself does not encompass all the ways in which people contribute to accidents. In their model of aberrant behavior (on which the present research is based), Reason et al. (1990) delineated three types of aberrant driving behaviors: violations (deliberate deviations from practices deemed necessary to maintain the safe operation of a potentially dangerous system), lapses (unintentional deviations from intention due to deficits in attention or memory), and errors (departures from planned actions toward a desired goal due to errors in judgment). Subsequently, Lawton et al. (1997) differentiated two subtypes of violations: ordinary (violations of traffic rules) and aggressive (related to hostility at the wheel).

Appraisal theory developed by Lerner and Keltner (2001) suggests that people who are more predisposed to anger are more optimistic about risk. This finding is interesting because it supports the need to understand the causal attributions behind driving behavior. Motivation is an internal state that activates, directs, and maintains behavior directed toward a target activity (Pinillos, 1977; Schunk et al., 2014) and is one of the most studied constructs in educational psychology (Koenka, 2020). The first motivational theory to be developed is Weiner's attributional theory (Weiner, 1985). A causal attribution refers to a set of beliefs and factors that a person identifies as the cause of an outcome or behavior, noting that the causes to which outcomes are attributed have salient emotional, cognitive and motivational consequences (Fernandez et al., 2015). Thus, the theory developed by Weiner (1986) conceptualizes behaviors through the causal attributions that people identify in previous situations and the consequences they attribute to them (Manassero and Vazquez, 1995). The author proposed the existence of three dimensions involved in the realization of attributions (Weiner, 1979).

The first dimension is internality, which refers to the perception of the source of the internal or external cause (the locus of control). The relationship between the traffic locus of control (T-LOC) and driving behavior has been investigated in numerous previous studies (Holland et al., 2010; Huang and Ford, 2012; Rejali et al., 2023). The findings indicate that internal locus of control orientation has a significant positive impact on predicting the number of traffic accidents, errors, and aggressive and ordinary violations, such that drivers who attribute the reasons for accidents to their own behavior are involved in traffic accidents more frequently than those who attribute the reasons for accidents to external factors (Özkan and Lajunen, 2005). The main problem in a highly internal locus of control orientation in traffic is that it may increase risky driving, because optimism transcends global perceptions of driving ability and the likelihood of accidents (DeJoy, 1989), also reflecting the role of overconfidence bias (Mohammadpour and Nassiri, 2021).

The second dimension is controllability, which refers to whether the cause is perceived as controllable or not (Davis et al., 2017). The importance of controllability observed in the face of various health threats and life events suggests that optimism may arise because people persistently overestimate the degree of control they have over events (DeJoy, 1989). In fact, studies show that young drivers, who are more optimistic about control in driving situations involving reflexes and vehicle handling, are more likely to be involved in accidents (Matthews and Moran, 1986). Biases in cognitive evaluations related to illusion of control and optimism about outcome accentuate aberrant behaviors, as they are empirically linked to poorer judgments and greater expression of risky behaviors (Stephens and Ohtsuka, 2014). The perception of excessive controllability or illusion of control has been investigated mainly in the field of gambling (Ohtsuka, 2013) although results have also been found on its predictive capacity for risky driving behaviors (Hammond and Horswill, 2002).

Finally, the third dimension is stability, a concept that the author developed because he saw that the attribution of some causes fluctuated (were perceived as transitory), while others remained constant (Weiner, 1971). In Weiner et al. (1976), it was shown that changes in expectations are related to the stability dimension and not to the locus of causality, which is important, not only because two attributional dimensions are discriminated, but also because a large proportion of the literature relates changes in expectations to the locus dimension. The stability of attributions produces a maintenance and even an increase in expectations (Manassero and Vazquez, 1995), playing a role in the repetition of risky behaviors. If a driver perceives that a risky maneuver had a positive outcome and attributes this success to a stable factor, he is more likely to repeat such behavior in the future. Unfortunately, this dimension has

little research on its relationship to risky driving behaviors, which underscores the importance of filling the gap in the literature with additional research.

However, the main objective of the present study is to analyze the relationship between the attributional styles of a sample of drivers and the frequency of their risk behaviors. Specifically, we will assess how locus of control, controllability and stability influence the prediction of aberrant driving behaviors, taking into account a number of covariate variables such as demographic factors (e.g., age and gender).

The hypotheses that have been put forward are specifically evidenced as follows:

- Hypothesis 1: A positive relationship between internal locus of control and risky driving behaviors is expected for both positive and negative outcomes.
- Hypothesis 2: A positive relationship between controllability and risky driving behaviors is expected for both positive and negative outcomes.
- Hypothesis 3: A positive relationship between stability and risky driving behaviors is expected for both positive and negative outcomes.

Method

Participants

A total of 42 drivers, of which 28 are women (66.7%), 13 are men (31.0%) and 1 non-binary person (2.4%), completed the survey, 100% of them being of Spanish nationality. Participants ranged in age from 22 to 68 years ($M = 35.09$; $SD = 16.52$). The marital status of 57.1% is single compared to 38.1% whose marital status is married or living with a partner. In terms of educational level, 69% of the participants had a university education, compared to 11.9% with a professional education, 14.3% with no education and 4.8% with secondary education. To continue, the range of family incomes of the participants is very wide, but the majority (26.2%) is in the range of between 21,000-30,000 euros per year. Finally, the length

of time in possession of a driver's license varies between 1 year and 47, with an average of 14 years; and the average number of participants drives 181 kilometers per week on average.

The sample is selected using a self-administered survey that includes three different assessment instruments. Inclusion criteria include all persons over 18 years of age who have a valid driver's license and are fluent in Spanish. As for the exclusion criteria, all persons without Spanish or Dominican nationality were excluded from the study.

Instruments

Sociodemographic questionnaire: A questionnaire was administered with general sociodemographic questions, collecting information on age, gender, marital status, nationality, educational level, annual family income and driving experience (measured by the number of years of possession of a driver's license and the average number of kilometers driven per week).

Driving attributional styles questionnaire: The questionnaire consists of a total of 16 Likert-scale items with seven response options, which present a variety of situations among which a series of positive or negative events are presented. Its main objective is to evaluate the different attributional styles in the specific field of driving, and to this end, each of its items explores three factors: Locus, Stability and Controllability. The Locus factor refers to the point at which a person believes that the event may be due to him/herself or to other circumstances or people (1=it is totally due to myself to 7=it is totally due to other circumstances/people). The Stability factor indicates the degree of frequency with which you believe the event will happen again in the future (1=never happen again to 7=certain to happen again). Finally, the Controllability factor indicates the degree of control each person perceives about an event happening again (1=I have no control at all over it happening again to 7=I can totally control it happening again). The present questionnaire is a newly created and newly applied instrument and therefore does not yet have data on its validity or reliability. It is based on the *Traffic Locus of Control* (T-LOC) questionnaire, which focuses only on the locus of causality dimension (Özkan and Lajunen, 2005); and on the *Attributional Style Questionnaire* (ASQ), which explores the dimensions of locus, stability and globality (Peterson et al., 1982).

Driver Behavior Questionnaire (DBQ) (Reason et al., 1990): The DBQ is a Likert-type response style questionnaire with 6 response options ranging from 0=Never to 5=Always, originally developed and designed to measure aberrant driving behavior. In this case, we administered the reduced version of the same (Parker et al., 2002), which consists of a total of 28 items organized into 4 factors: lapses (unintentional behaviors that are carried out due to attention or memory deficits, e.g., skipping the freeway exit), errors (unintentional acts that fail to achieve the planned and intended outcome due to errors in judgment, e.g., braking too abruptly), ordinary violations (acts about which the person is largely conscious related to breaking traffic rules, e.g., running a red light) and aggressive violations (conscious acts related to hostility behind the wheel, e.g., arguing with other drivers) (Martinussen et al., 2014). The *Driver Behavior Questionnaire* has good cross-cultural validity and internal reliability with a high Cronbach's alpha for all factors (Özkan et al., 2006).

Procedure

Participants were contacted through different social networks (forums, Whatsapp, Instagram, etc.), providing brief information about the study and attaching a link to the survey in Google Forms. It is important to mention that the survey included a section that requested the consent of the participants to be part of the study, and it was strictly mandatory that they gave it in order to complete the survey. In this, the voluntary nature of participation, the anonymous and confidential nature of the survey in question and the possibility of abandoning the form at any time without any negative consequences are declared. In addition, a general description of the study was included which ensured that all participants could understand the

objectives, and which, in turn, stressed the need to possess a vehicle driving license in order to complete the form. Finally, a brief explanation of the evaluation protocol is included, where the greatest possible sincerity is requested in the answers, since there are no right or wrong answers, in order to prevent social desirability bias.

Before proceeding with the survey, a section was dedicated to collecting the sociodemographic data of the patients (age, nationality, marital status, etc.). The survey in question was composed of a total of 51 items and its response time was approximately 10 to 15 minutes.

Data collection took place between October 31 and January 7. Once this date was reached, the data were stored in a file and analyzed. For this data collection, no identifying data of the participants were recorded.

Finally, it is important to mention that the research has been approved by the Ethics Committee of the Universidad Europea del Atlántico.

Results

First, a descriptive analysis of the sample participants was performed considering the different demographic variables surveyed.

To follow, a Pearson correlation analysis was conducted to explore the relationship between the dimensions of causal attribution, demographic variables and aberrant driving behaviors, determining the strength and direction of the relationships between pairs of variables. Thus, correlations have been analyzed between causal attribution dimensions (locus, control and stability, positive and negative), sociodemographic variables (age and weekly kilometers) and aberrant driving behaviors (violations, aggressive violations, errors and lapses). The results, summarized in Table 1, showed several significant correlations. To begin with, looking at the trends between causal attributions and aberrant behaviors in positive situations, the following findings should be highlighted: an external locus of control correlates positively with the probability of having a lapse at the wheel; the attribution of stability to positive events is positively related to the probability of making mistakes; and there is a significant correlation between controllability and all the dimensions of aberrant behaviors, showing that the higher the perception of controllability, the lower the probability of carrying out risky behaviors, except in the case of lapses, where a higher perception of controllability will increase the latter. On the other hand, the following findings stand out regarding the trends between causal attributions and aberrant behaviors in negative situations: there is a positive correlation between an internal locus of control and aberrant behaviors, showing that the greater the internality, the greater the probability of committing lapses and aggressive driving violations; and controllability again shows a negative correlation with all the dimensions of aberrant behavior, so that a greater perception of controllability will cause the latter to be diminished. It is also interesting to comment on the results found when looking at how attributional styles are related to each other: the internal locus of control is positively correlated with a greater perception of controllability in the case of positive situations, just as a greater attribution of stability to positive situations is also positively correlated with a greater perception of controllability. Finally, it should be noted that age presented a significant negative correlation with rape and aggressive rape.

Finally, the t-test for independent samples was used to compare the means of the variables between two groups of cases, specifically, to compare the scores of the dimensions of causal attribution and aberrant behaviors in the population of men (N=13) and women (N=28). This analysis evaluates whether the differences observed in the means of the two groups are

statistically significant. The results, presented in Table 2, showed significant differences related to the causal attribution dimensions in the stability scores in positive situations, where women obtained significantly higher scores than men. For their part, with regard to aberrant behaviors, significant differences were found in rape scores, where males scored higher than females; as well as in aggressive rapes, where males also scored significantly higher than females. No significant differences were found between men and women for the rest of the variables. It is worth noting that the highest mean score in the case of men was in the controllability variable in negative situations, while the highest mean score in the case of women was found in the stability variable in negative situations.

Table 1
Correlation analysis between attributional dimensions and aberrant driving behaviors

	Age	Km	Locus +	Stab +	Control +	Locus -	Stab -	Control -	Viol	Viol agres	Errors	Lapsus
Age	-	.39**	.14	-.01	-.27	-.16	.08	.05	-.36*	-.39**	.20	.03
Km		-	-.19	-.19	.05	-.02	-.04	.01	.08	-.02	.29	.31
Locus +			-	-.30	-.31*	.36*	.24	.04	-.18	.14	-.22	.32*
Stability +				-	.31*	-.15	.19	.11	-.37	.15	.33*	.21
Control +					-	-.07	.01	.04	-.32*	-.37**	-.36*	.32*
Locus -						-	.22	-.31*	-.25	-.39**	-.28	-.37*
Stability							-	-.26	-.08	-.18	-.01	-.12
Control -								-	-.37*	-.41**	-.36*	-.48***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. The "+" symbol refers to positive events, and the "-" symbol refers to negative events.

Tabla 2
Diferencias en las puntuaciones entre hombres y mujeres

	Género				t
	Hombres (n = 13)		Mujeres (n = 28)		
	M	SD	M	SD	
Locus +	9.00	3.27	9.07	3.80	-0.60
Estabilidad +	19.15	5.19	22.25	4.06	-2.08*
Control +	19.38	4.59	19.64	4.19	-1.78
Locus -	34.38	9.70	39.21	8.30	-1.64
Estabilidad -	47.84	9.42	53.21	10.41	-1.58
Control -	56.76	10.34	52.96	9.88	1.13
Violaciones	6.78	1.56	5.12	2.16	2.97*
Viol. Agresivas	6.24	2.58	4.32	2.07	2.14*
Errores	5.45	3.01	5.21	2.37	1.12
Lapsus	5.87	2.56	6.11	2.89	0.89

Nota. * $p < .05$. El símbolo "+" hace referencia a eventos positivos y el símbolo "-" a eventos negativos.

Discussion and Conclusions

The present research was developed with the aim of analyzing the relationships between the dimensions of causal attribution and aberrant driving behaviors, exploring also the differences in gender and age of the participants. The results reflect a number of patterns consistent with previous studies and offer new data that contribute to the understanding of psychological factors associated with driving.

In line with the first hypothesis, a positive correlation was observed between internal locus of control and certain risky driving behaviors, such as lapses and aggressive violations. This means that the greater the internal locus of control in negative situations, the more aggressive behaviors will be presented. On the other hand, it has been found that in the case of positive situations, a higher external locus of control is associated with a higher probability of committing a lapse. Thus, the hypothesis is partially confirmed. These results are congruent with previous research that has indicated that an internal locus of control in traffic may be associated with a greater perception of control over outcomes, which may reinforce risky behaviors due to unrealistic optimism about one's own driving abilities (DeJoy, 1989; Matthews and Moran, 1986). This overconfidence bias could explain why drivers with internal locus are more likely to engage in risky maneuvers, attributing their success to personal skills and underestimating external factors such as environmental conditions or the actions of other drivers. On the other hand, the fact that a more external attributional style is related to more aggressive behavior in positive situations may have to do with the same factor of overconfidence and unrealistic optimism about external conditions, which leads the driver to a state of relaxation that is more conducive to the occurrence of lapses.

In relation to the second hypothesis, the controllability dimension showed the most consistent relationships with aberrant behaviors, with significant correlations in each of the 4 dimensions (violations, aggressive violations, errors and lapses) in both positive and negative situations. The results show a clear trend of negative correlation between controllability and aberrant behaviors, suggesting that the higher the perception of controllability, whether in positive or negative situations, the lower the probability of carrying out aberrant driving behaviors. The only exception is lapses, which in the case of positive situations, a greater perception of controllability would lead to a higher probability of committing the latter. Thus, the hypothesis is rejected and the need for further research on this dimension and its

relationship with aberrant driving behavior is raised. Although previous research has pointed to the influence of the illusion of control on aggressive driving (Hammond and Horswill, 2002), the current data indicate that this effect should be more extensively investigated because of its powerful relationship with risky driving behaviors.

One possible explanation for these findings is that the illusion of control (which in previous research has been shown to be related to risky driving behaviors) refers to a perception of excessive controllability, and in our case, the sample presents a low-moderate perception of controllability. Thus, the perception of controllability seems to act as a protective factor, but if a higher controllability were present, the results could be the opposite. Therefore, it would be very interesting for future lines of research to explore the differences in aberrant behaviors between low/moderate controllability and high controllability.

Finally, the third hypothesis is confirmed, since stability also showed significant positive associations with risk behaviors, although these relationships were weaker than those observed for locus of control or controllability. This finding suggests that the attribution of stability of outcomes may influence drivers' predisposition to engage in risky behaviors, specifically, showing a significant correlation between the attribution of stability and the likelihood of making mistakes (unintentional acts that fail to achieve the intended outcome due to errors in judgment) in the case of positive situations. The attribution of success to stable causes in risky maneuvers could reinforce expectations of future achievement as raised in the theoretical framework (Manassero and Vázquez, 1995), leading the person to perform maneuvers that may trigger errors more easily. However, the literature on stability in the driving setting is scarce, and our findings highlight the need to further investigate this dimension in road risk contexts, due to the observed relationship. It is also noteworthy that stability correlates with controllability significantly only in positive situations, which highlights that it is easier to attribute the probability of something happening again in the future and controllability when we talk about a success, rather than when we talk about a failure.

On the other hand, in terms of sociodemographic variables, it is important to note the negative correlation between age and ordinary and aggressive violations, suggesting that the older the age, the lower the probability of engaging in risky driving behaviors, acting as a protective factor. This is consistent with previous research claiming that young people are involved to a greater extent in traffic accidents due to driver negligence or poor vehicle handling (Aberg and Rimmo, 1998; Matthews and Moran, 1986). Likewise, the gender differences observed in the variables studied are relevant and are in line with previous research. Females scored significantly higher on positive stability, while males showed a higher prevalence of rape and aggressive rape. These results can be interpreted from theories that relate gender differences to distinct attributional and emotional patterns. For example, women tend to show a more external locus of control in certain situations, which could act as a protective factor against risky behaviors (Özkan and Lajunen, 2005). On the other hand, men tend to engage more in aggressive driving behaviors, probably due to factors such as sensation seeking or a greater predisposition to act impulsively under intense emotions such as anger (Liu et al., 2021).

The study findings have important implications for road safety, especially for the design of preventive interventions. On the one hand, it would be relevant to develop educational programs that address optimistic expectations and attributional styles in driving, fostering greater awareness of the risks associated with specific behaviors. We can find some examples of this type of programs in the context of sport psychology (Castellano and Rodríguez, 2007) or educational psychology (Torre and Godoy, 2002). On the other hand, integrating emotional components into these interventions could be key, given that variables such as anger and aggression appear to play a mediating role between attributional dimensions and risk

behaviors (Stephens et al., 2021; Zhang et al., 2019). In addition, as Failde-Garrido et al. (2023) in their research, the results may have practical implications for the detection and rehabilitation of offenders, as well as for the imposition of penalties for road safety offenses.

The findings also highlight the need for further research on stability and its interaction with other psychological factors in driving. Specifically, future research could explore the role of variables such as impulsivity, frustration tolerance and/or emotional regulation in the relationship between attributional styles and aberrant behaviors. This line of work could help clarify how stable attributions may reinforce risky behaviors and design more effective strategies to counteract this effect. In addition, as previously mentioned, it would be relevant to examine the influence of cognitive biases, such as the illusion of control, which could enhance the repetition of risky driving behaviors and may be explanatory of the results found in this study. Finally, the gender differences identified suggest that future studies devoted to preventive interventions should be tailored to the specific characteristics of men and women, taking into account their attributional and behavioral patterns.

Although this study offers valuable contributions, it also has some limitations that should be considered. First, the sample size, especially the group of men, is relatively small, which could limit the generalizability of the findings. To continue, the research relied entirely on self-reported measures, which may imply response biases due to social desirability or subjective perception of one's own behavior. Thus, it would be interesting to replicate the results using other types of objective behavioral measures. Some alternatives could include the use of driving simulators/virtual reality, from which the decisions and reactions of participants in risk situations are directly evaluated; observational studies in real or controlled environments that allow behavioral patterns to be recorded; or through records of traffic incidents. In addition, the cross-sectional design of the research prevents the establishment of causal relationships between the variables studied, since it is not completely clear whether drivers' predisposition to adopt risky behaviors is due to their attributional styles or whether they develop as a result of previous driving experiences. To address this limitation, it is recommended that longitudinal studies be developed to analyze the evolution of these variables over time.

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