

PODIUM

Journal of Science and Technology in Physical Culture

SCIENTIFIC PUBLICATIONS DEPARTAMENT

Volumen 16
Issue 3

2021

University of Pinar del Río "Hermanos Saíz Montes de Oca"

Director: Fernando Emilio Valladares Fuente

Email: fernando.valladares@upr.edu.cu

Translated from the original in spanish

Original article

Psychological training for the stimulation of resilience in the national table tennis team

Entrenamiento psicológico para la estimulación de la resiliencia en el equipo nacional de tenis de mesa

Treino psicológico para a estimulação da resiliência na equipa nacional de Tênis de mesa

Mónica Huie Martínez^{1*}  <https://orcid.org/0000-0002-5647-2432>

Marta Cañizares Hernández¹  <https://orcid.org/0000-0001-9504-9779>

María del Rosario Martínez Hernández¹  <https://orcid.org/0000-0001-5920-0005>

¹Universidad de Ciencias de la Cultura Física y el Deporte "Manuel Fajardo. La Habana, Cuba.

*Corresponding author: monicah.martinez86@gmail.com

Received: 17/05/2021

Approved: 07/07/2021.

How to cite ítem: Huie Martínez, M., Cañizares Hernández, M., & Martínez Hernández, M. (2021). Psychological Training for the stimulation of resilience in the national table tennis team /Entrenamiento psicológico para la estimulación de la resiliencia en el equipo nacional de tenis de mesa. *PODIUM - Journal of Science and Technology in Physical Culture*, 16(3), 917-933. <https://podium.upr.edu.cu/index.php/podium/article/view/1139>

ABSTRACT

The present work corresponds to the research carried out on psychological resilience in athletes of the national Table Tennis team and with the theme of High Performance Sports. Its objective was to elaborate a proposal for a psychological training program to stimulate resilience in athletes of the U-18 and U-21 categories of the national table tennis team. The need to conduct studies that explore resilience in the field of Sport

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Psychology reveals the importance and timeliness of the topic, due to the contribution of this capacity to the performance of athletes during the training and competition process. In order to fulfill the research objective, methods from the theoretical level such as analysis and synthesis and from the empirical level, observation, interview, as well as the Resilience Scale and the Stress Coping Questionnaire were used. The main results made it possible to confirm the presence of medium and high levels of psychological resilience in the athletes studied, it was identified the protective and risk factors that influence the coping with life events and stressful situations. In addition, they made possible the elaboration of the psychological training program proposal, in correspondence with the findings. The program proposal consisted of 16 sessions, aimed at stimulating psychological resilience in the national table tennis team; it was submitted to the criteria of 11 specialists for the evaluation of its design, feasibility and usefulness, where it was highly valued by them.

Keywords: Psychological training; Program; Psychological resilience; Table tennis.

RESUMEN

El presente trabajo se corresponde con la investigación realizada sobre la resiliencia psicológica en atletas del equipo nacional de Tenis de mesa y con la temática de Deporte de Alto Rendimiento. Tuvo como objetivo: elaborar una propuesta de programa de entrenamiento psicológico para estimular la resiliencia en atletas de las categorías Sub-18 y Sub-21 del equipo nacional de Tenis de mesa. La necesidad de realizar estudios que exploren la resiliencia en el ámbito de la Psicología del Deporte revela la importancia y actualidad del tema, por la contribución de esta capacidad al rendimiento de los atletas durante el proceso de entrenamiento y competencia. Para cumplir con el objetivo de investigación, se utilizaron métodos del nivel teórico como el análisis-síntesis y del nivel empírico: la observación, la entrevista, así como la Escala de resiliencia y el Cuestionario de afrontamiento al estrés. Los resultados principales permitieron constatar la presencia de niveles medio y alto de resiliencia psicológica en los atletas estudiados, se identificaron los factores protectores y de riesgo que influyen en el afrontamiento de eventos vitales y situaciones estresantes. Además, posibilitaron la elaboración de la propuesta del programa de entrenamiento psicológico, en correspondencia con la constatación realizada. La propuesta del programa estuvo constituida por 16 sesiones, dirigidas a estimular la resiliencia psicológica en el equipo nacional de Tenis de mesa; fue sometida a criterio de 11 especialistas para la evaluación en su diseño, viabilidad y utilidad, donde se obtuvo una alta valoración por parte de estos.

Palabras clave: Entrenamiento psicológico; Programa; Resiliencia psicológica; Tenis de mesa.

RESUMO

O presente trabalho corresponde à investigação realizada sobre a resiliência psicológica em atletas da equipa nacional de Ténis de Mesa e com o tema do Desporto de Alto Rendimento. O seu objetivo era elaborar uma proposta de programa de treino psicológico para estimular a resiliência dos atletas das categorias sub-18 e sub-21 da equipa nacional de Ténis de Mesa. A necessidade de realizar estudos que explorem a resiliência na área da Psicologia do Desporto revela a importância e atualidade do tema, devido à contribuição desta capacidade para o desempenho dos atletas durante o processo de treino e competição. A fim de cumprir o objetivo da investigação, utilizámos métodos do nível teórico como a análise-síntese e do nível empírico: observação,



entrevista, bem como a escala de resiliência e o questionário de resposta ao stress. Os principais resultados permitiram-nos confirmar a presença de níveis médios e elevados de resiliência psicológica nos atletas estudados, e identificar os fatores de proteção e de risco que influenciam o enfrentamento dos eventos da vida e das situações de stress. Além disso, permitiram a elaboração da proposta do programa de formação psicológica, em correspondência com os resultados. A proposta de programa consistiu em 16 sessões, destinadas a estimular a resiliência psicológica na equipa nacional de Ténis de Mesa; foi submetida aos critérios de 11 especialistas para a avaliação da sua concepção, viabilidade e utilidade, onde foi altamente valorizada por eles.

Palavras-chave: Treino psicológico; Programa; resiliência psicológica; Ténis de mesa.

INTRODUCTION

Research on human behavior, dedicated to the study of the response to difficult circumstances, suggests that certain people are capable of overcoming adversity and transforming themselves positively in the midst of it (resilience), while others become increasingly vulnerable.

The resilience construct has been researched jointly in the rest of the world outside and inside sport by authors such as: *Rutter (1992)* who emphasized the active role of individuals in the face of what happens to them; *Munist et al. (1998)* who expressed that resilience considers, then, the need to reach the maximum potential of each individual in the interaction of personal characteristics with a facilitating environment, through a spiral process, where the stages of the life cycle are updated in the achievement of the following ones.

Psychological resilience has been treated as the capacity of a person or group to recover in the face of adversity in order to continue projecting the future (*Ruiz-Barquín et al., 2012*). These researchers, when studying cases of this construct, report that, in difficult circumstances or high-impact traumas in these people, latent resources that were unknown to them emerge.

This inherent human response capacity derives from the existence of a reserve of internal resources for adjustment and positive coping (*Botero and Páez, 2020*), whether innate or acquired.

Artuch (2020) and *Vargas et al., (2020)* highlight as part of the resilient response, the role played by social support networks as protective factors for the individual to feel able to handle adverse experiences.

According to the literature consulted, in the sports context the exact historical moment in which the concept of resilience was introduced has not yet been defined, but it is closely related to the conception of psychological resistance to training loads (*Fernández et al., 2020*).

Among the theoretical models of psychological resilience most widely addressed in the field of sports, those of *Galli & Vealey (2008)* and *Fletcher & Sarkar (2012)* stand out for their objectivity, coherence, consistency and intersubjectivity.



The characteristics of high-level athletes in the face of setbacks and the resilient profile as a variable for the development of high performance are essential aspects in the approach to psychological resilience, both in athletes and in sports teams (Morgan *et al.*, 2019; Fernández *et al.*, 2020).

Within the international research on psychological resilience in sport, the following stand out: Fonseca and Noce (2018); Gallego and Salinas (2019); Reche *et al.*, (2020); Sarkar and Page (2020). In the study of psychological resilience levels related to anxiety, self-confidence and predisposition to achieve performance close to individual maximum levels, the contributions of Reigal *et al.*, (2018); Tarazona *et al.*, (2020) are appreciated.

Regarding the link between psychological resilience and recovery from stressors, the authors Codonato *et al.*, (2018); Álvarez *et al.*, (2019) and Turner *et al.*, (2020) are highlighted.

In addressing the responses of athletes as a consequence of having suffered a sports injury, the studies by Ríos *et al.*, (2019); Catalá and Peñacoba (2020); León *et al.*, (2020) and Ríos *et al.*, (2021) stand out.

Other authors such as Aranzana *et al.*, (2018); González Arratia (2018); Ortín *et al.*, (2018); Reche *et al.*, (2018); Trigueros *et al.*, (2019) and Serrano *et al.*, (2021), have addressed the relationship of psychological resilience with optimism and psychological wellbeing. Also noteworthy are the studies by Mohammadi (2019); McLean *et al.*, (2020) and Aguinaga *et al.*, (2021) on coping with adverse situations, as part of the resilient process. The research is based on the concept defined by Grotberg (2006), which states that psychological resilience is the "capacity of human beings to cope with life's adversities, overcome them and emerge strengthened or even transformed by them". It is essential for the understanding of the construct to include the notion of adversity, positive adaptation despite difficulties, and dynamic process as components in its conceptualization (Bryan *et al.*, 2019).

In Cuba, from the literature consulted, it is considered that there have been insufficient studies on psychological resilience in sport; these cover some sports disciplines such as 800-meter track and field races (Cañizares *et al.*, 2017, 2018 and 2020; Cadalso *et al.*, 2020) and baseball (Fernández *et al.*, 2020).

In observations of qualifying competitions and in interviews with the psychologist of the national table tennis team, prior to the present research (Huie, 2020), it was found that the athletes of this team have difficulties in adapting to the opponent's game system, handling adverse situations and using coping mechanisms in these situations.

This inconsistency impacts tactical decision making in less time, affects the duration of the game and results in pessimism, uncertainty, emotional instability, irrational thoughts and frustration in athletes.

Hence, the following problematic situation arises: The athletes of the national Table Tennis team present difficulties in their actions when facing adverse situations and there are no psychological training programs aimed at stimulating psychological resilience.

In this sense, not being resilient makes it difficult to make decisions in line with what the adequate management of the adverse situation merits.



Therefore, the scientific problem is established as follows: How to stimulate psychological resilience in athletes of the U-18 and U-21 categories of the national table tennis team? Hence, the objective of the research is defined as: to elaborate a proposal for a psychological training program to stimulate resilience in athletes of the U-18 and U-21 categories of the national table tennis team.

In the study of psychological resilience in Table Tennis athletes, it is essential to develop strategies to handle adverse situations typical of sports practice, given the psychological demands of this sport.

MATERIALS AND METHODS

The research predominantly used qualitative methodology with quantitative methods for data collection and qualitative methods for data interpretation. The study developed corresponds to a descriptive design.

Psychological resilience was defined as the main category.

For the Protective Factors dimension, the following indicators were established: personal satisfaction, equanimity, feeling good on one's own, self-confidence and perseverance. For the Coping Mechanisms dimension, the indicators defined were: task-focused stress coping styles and psychological resilience strategies. The indices, based on the established indicators are: High, Medium and Low level of development.

In the present research, methods from the theoretical level such as analysis-synthesis and from the empirical level, such as:

Interview with athletes, coaches and psychologist of the national team.

- Observation: eight non-participant observations were made during the preparatory period and five in the 2019 qualifying controls of the special stage.
- Resilience Scale. It has been translated and validated in soccer players of formative age and has been applied in previous research in the sports context in Cuban youth baseball athletes.
- Stress coping questionnaire. Some *items* of the questionnaire were adapted to the research context. A pilot test was carried out first to check the quality of the adaptation.
- Specialist criteria: 11 professionals in Sport Psychology and Physical Culture were selected. Of these, five were PhD, five with a Master's degree in Science and one with a Bachelor's degree in Physical Culture, with a range of years of experience from 7 to 52 years. These specialists have worked with sports teams and, given their capacity for analysis, their level of mastery in the researched subject matter and satisfactory results in their professional activity, they provided rigorous criteria for the document prepared.
- Psychological intervention methods and techniques: educational talk, animation and activation, oral, written and corporal expression, breathing and autogenic relaxation, cognitive-behavioral (self-mandates, positive self-affirmations, focus on the solution of the problem, positive re-evaluation), simulation of competition



scenarios, modeling of sports competition, imagery, visualization, video projection, evaluation and self-evaluation.

- Statistical-mathematical processing: descriptive statistics was used. Percentage analysis was used as a measure for the quantitative analysis of the research dimensions.
- Triangulation: Methodological triangulation of different methods and techniques (quantitative and qualitative) was used.

In addition to this analysis, a qualitative analysis was carried out through a content analysis. Tables and figures were used to represent the information.

The study took place at the High Performance Center located at the High Performance Athletes Training School (Esfaar), "Cerro Pelado", in the Table Tennis room. The population consisted of 12 athletes of the national table tennis team of the U-18 and U-21 categories, six female athletes and 6 male athletes. The sample is 100 % of the population, it was chosen intentionally, taking into account the following selection criteria:

- U-18 and U-21 athletes of the national table tennis team.
- Informed consent to take part in the research.
- Permanence in the Category for one sports cycle.

The main limitations were directed to the time availability of the athletes, taking into account that these athletes participate in competitions outside the country and also train in international training bases.

The research was conducted over a period of approximately one year and one month. It was developed in interdependent stages:

As a starting point for the research, the first phase was fundamentally directed to the request for informed consent. It continued with the review of the bibliography on psychological resilience and the preparation of the athlete, which made it possible to establish the main conceptual definitions. In addition, the research problem was defined, the objective was defined and the techniques foreseen in the initial verification were applied, where a diagnosis of the current state of psychological resilience in the athletes studied was made.

In this sense, the interview was applied to athletes, coaches and team psychologist; nonparticipant observation during the special stage of the preparatory period, the Resilience Scale and the Stress Coping Questionnaire.

In the second phase, a proposal for a psychological training program to stimulate resilience in the selected team was prepared, based on the initial diagnosis, and the proposal was submitted for evaluation by specialists.



RESULTS AND DISCUSSION

From the techniques applied, the main findings of the research were the existence of the following adverse situations in the national table tennis team:

- SITUATION 1- Inadequate perception of the event (leagues, tournaments, international competitions, qualification for world and Olympic championships).
- SITUATION 2 - Making mistakes in the game.
- SITUATION 3 - Loss (of a deciding point, a set or a qualifying match).
- SITUATION 4 - Pressure on the decisive points that define the game.

Among the main aspects that condition situations 2, 3 and 4 is distraction in the face of destabilizing elements (sound of the ball, referee's decision, scoreboard situation, public expressions, too many indications in the games, among others).

- SITUATION 5 -Injuries in the game.

As personal factors existing in 100 % of the athletes, positive emotions, optimism, perseverance, the ability to make decisions, to solve problems, family and coach support stand out.

The present risk factors identified are: lack of self-confidence (83 %), anxiety (75 %), perspective of failure in stressful situations (50 %) and difficulties in impulse control (75 %).

Analysis of the resilience scale With respect to the results obtained from the Resilience Scale (Wagnild and Young, 1993), as can be seen in Figure 1 of the total number of athletes, it was obtained that 75 % have a medium level of resilience, given by a tendency to emotion-focused coping and avoidance, lack of manifestation of resilient behavior and lack of use of resilience strategies in specific adverse situations (Figure 1).

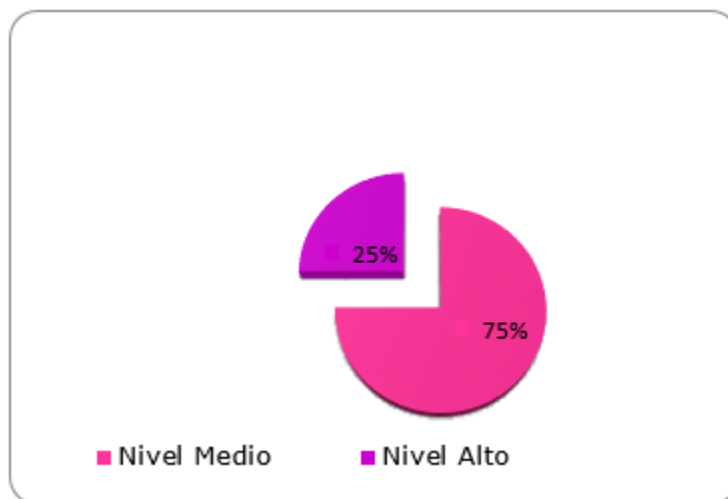


Fig. 1. - Levels of resilience in athletes (Resilience Scale)



This means that most athletes need to further develop personal psychological resilience factors such as: satisfaction, equanimity, feeling good about themselves, perseverance and self-confidence.

While the 25 % with a high level of resilience show high personal satisfaction, having a better understanding of life, greater equanimity, while taking calmly the experiences they have had in their sport, maintaining a positive attitude towards difficulties, as well as enjoying the feeling of well-being with themselves, greater capacity to believe in themselves and perseverance in the face of adversity, which implies more persistence in sports practice.

- Stress Coping Questionnaire Analysis

From the application of the Stress Coping Questionnaire (Sandín and Chorot, 2002), it was obtained that the coping style focused on emotions is the most used by 50 % of the athletes, which evidenced the need for training in task-focused coping. Emotions can be allies or enemies in the management of stressful situations; self-regulation of negative emotional states is essential to focus attention on the game.

In the analysis of the Coping Mechanisms dimension with respect to the Task-focused coping style indicator, figure 2 shows that 25 % of the sample *frequently* uses problem-solving focus (PS) and positive reappraisal (PR). 16.7 % *almost always* use FS, as well as support seeking (BA), while 50 % of the sample *sometimes* resort to FS. In addition, 50 % of the athletes *sometimes* resort to PR as well as BA, which means that the task-focused coping style is not the style most frequently used by them (Figura 2).

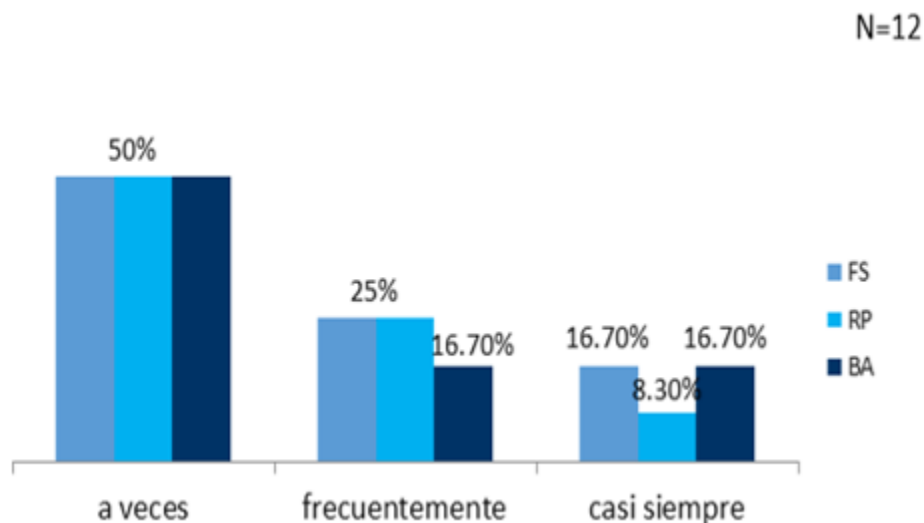


Fig. 2. - Coping Mechanisms Dimension, Indicator Task-focused Coping Style

Elaboration of a proposal for a psychological training program to stimulate resilience.

The methodological procedure for the preparation of the proposal was as follows:

- Selection of the topics to be addressed.
- Definition of the objective and content of the sessions.



- Determination of the person in charge and the participants of the same.
- Selection of the techniques to be used in the different moments of the session.
- Evaluation by specialist criteria.

The objectives of the program, the practical requirements of the application, the phases, the rationale of the intervention, the logical methodological structure of the sessions and the program evaluation procedure were established.

The program was designed with a psychosocial approach, considering: objective and content of each session, number and duration of sessions, corresponding activities, frequency, means of work and evaluation based on the proposal developed by [Cañizares \(2004\)](#).

At this stage, specific techniques were selected to conform the sessions of the psychological training program ([Dosil, 2004](#)): educational talks, oral, written and body expression techniques, relaxation, cognitive-behavioral, thought control, visualization and video projection. In them, the psychological profile of each athlete, the characteristics of their game system ([Barrero, 2018](#)) and the real needs of the team were considered.

Other techniques used were: participant observation, evaluation and self-evaluation techniques, individual orientations, triangulation, document analysis and specialists' criteria. The proposal of the psychological training program for the stimulation of resilience was submitted to the criteria of 11 specialists of high scientific rigor, mastery of the subject matter addressed, experience and satisfactory results in high performance sports, which made it possible to evaluate the program in its design through the criteria of specialists ([Fleitas et al., 2013](#)).

The specialists studied the proposal and expressed their criteria through an unstructured interview on the goodness, deficiencies or inadequacies of the program, both in terms of the quality of its theoretical conception and its possible application in practice. The evaluation of the psychological training program, once elaborated, was based on three aspects: design, feasibility and usefulness, as shown below (Table 1).

Table 1. - Aspects evaluated by specialist criteria

No.	Aspects	High	Media	Low
1	Design	91 %	9 %	0
2	Feasibility	100 %	0	0

These specialists evaluated the program as having a high level of adequacy in the evaluation of its design, feasibility and usefulness, which is a result of great significance for the research.

The main suggestions were: to structure the sessions taking into account the expected preparation and training period; to adapt the intervention techniques to Table Tennis and to plan exchanges with the athletes and coaches to inform about the results of the diagnosis and the achievements in the psychological training. These indications were



considered and once the modifications were made, the sessions were structured as shown below:

Session 12. I can be resilient by overcoming the adverse situation.

Dimension: coping mechanisms.

Objective: to train in resilience strategies to cope with stress.

Content: resilient overcoming strategy.

Intervention techniques: self-affirmations.

Task: to train in the resilient overcoming strategy in the face of difficulties.

Duration: 1 hour.

Procedure:

- Presentation: welcome. Introduction to the topic.
- Activation and animation: drawing on an object that represents overcoming. Each athlete should present the drawing to the group and explain its meaning.
- Development: adverse situations # 2, 3 and 5 are worked on.

It will be explained that overcoming is a resilience strategy, understood as the capacity to overcome (to give one's best to manage the situation and move forward despite the difficulty, to build positive life behaviors (modify habits, attitudes) and to preserve integrity (to take care of oneself, above all)).

Training in overcoming strategy

- Written completion "I am..., I am in.... I can...I have"
- Mentally replace the phrase "I can't" with the positive affirmation "I can (overcome obstacles such as muscular discomfort, injuries, difficulties, losses and see them as opportunities for growth, learn from mistakes, preserving above all the integrity)".

Frequency: twice a week before training.

It will be left as an individual orientation for each athlete to reflect on what have been the vital moments that he/she has overcome as an athlete and as a person?

Closing evaluation: How did you feel about today's session?

Main components of the Psychological Training Program to stimulate resilience
Objective: to stimulate psychological resilience in athletes when faced with adverse situations in table tennis.



Contents:

Due to the dynamics of the teaching-learning process, the following contents are combined with different components of physical, technical-tactical and theoretical-psychological preparation:

- Psychological resilience -self-esteem -self-confidence -emotional management motivation -decision making -perseverance -thought control -positive reappraisal resilient coping strategies -social support.
- Rationale for the psychological resilience training program.

The bibliographic consultation made it possible to elaborate the proposal based on the contributions of [Mari \(1997\)](#); [Cañizares \(2004\)](#); [Aybar and Morales \(2020\)](#) and [Moo and Góngora \(2020\)](#).

About the methods used

The methods and techniques of psychological intervention are adjusted to the specific demands of table tennis and the team, as well as to the needs arising from competitive psychological demands.

Procedures for the application of the psychological training program

The training process consists of the following phases for its organization and development: contact, motivation, transformation or modifying phase.

Practical program application requirements

Responsible: researcher.

Executor: psychologist of the national team.

Participants: athletes, coaches.

Duration of each session: approximately 1 hour (16 hours in total).

It is a fundamental requirement for the application of the program to achieve favorable psychological atmospheres among the members, to commit each athlete to participate in the training, to consider the cumulative-progressive character of the training, to check the fulfillment of the objectives of the previous sessions and to provide the corresponding feedback in each session.

From the determination of the theoretical foundations that support this study, it is contributed to fill the theoretical gap found in the literature on psychological resilience in table tennis. The diagnosis carried out made it possible to verify the level of psychological resilience existing in the athletes of the U-18 and U-21 categories of the selected team, prior to the development of the psychological training program to stimulate this capacity.

The results obtained coincide with the research by [Fletcher and Sarkar \(2012\)](#) regarding the fact that, by possessing resilient characteristics, athletes evaluate stressful situations as motivating and not as a threat. Furthermore, they correspond with [Fernández et al., \(2020\)](#) in that those athletes with high resilience level tend to frequently use a task-focused style, manifested in positive reevaluation, problem-solving focus, and seeking



social support. Reevaluation of the difficult situation and the self-perception of being able to cope with it increase the ability to overcome adverse experiences, become stronger and overcome them. Through the criteria of 11 specialists of high scientific rigor, a high evaluation of the program was obtained in terms of its design, usefulness and viability, given by the sessions, which objectives and content respond to the problems identified in the diagnosis, referred to the management of adverse situations and by the adjustment of these sessions to the competitive psychological demands of table tennis.

This evaluation of the program constitutes an aspect of great significance, since it endorses the application of the psychological training program in practice.

This work contributes to stimulate psychological qualities in the national team, as the training in resilience within the psychological preparation allows them to face adversities from the perspective of personal growth. They learn to balance their emotions, manage stress and, in turn, raise their self-concept by feeling more capable of dealing with any situation that may arise in sports training and competition.

The results achieved correspond to those expressed by *Cañizares et al., (2020); Cadalso et al., (2020); Aybar and Morales (2020); Moo and Góngora (2020) and Gupta and McCarthy (2021)*; who in their research highlight the importance of psychological interventions in the psychological preparation of athletes, which allow them to achieve an "optimal state of mental fitness", modify the aspects that may have a negative character, weaknesses, inadequacies, reinforce or enhance the resources that the athlete or the team has, resolve difficulties, strengthen existing aspects, mobilize cognitive-affective and volitional reserves of behavior and encourage the athlete to develop solution strategies to adverse or stressful situations that arise.

Therefore, it is essential to train in resilience, as it constitutes a learning process for life, through the support of personal and social factors that protect and provide strength in the face of such situations.

ACKNOWLEDGMENTS

It is desired to thank to the family members' support, to the research thesis tutor PhD Marta Cañizares, the research collaborators: MSc. Annia Mariela Pérez Palma, psychologist of the national table tennis team, PhD. Bárbaro Concepción Oliva, national commissioner of this sport. To the professors of the master's program for sharing their knowledge and experience, to the colleagues of the master's program and CEPAFD for their understanding, affection and support.

To the national table tennis team, especially to the athletes and coaches who were part of this study, for all the trust and support provided. Finally, to all the people who contributed to this research. Thank you.



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Conflict of interests:

The authors declare not to have any interest conflicts.

Authors' contribution:

The authors have participated in the writing of the work and analysis of the documents.



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