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Original article

Comparative study of the concentration of attention in boxers, before and after psychological intervention

Estudio comparativo de la concentración de la atención en boxeadores, antes y después de la intervención psicológica

Estudo comparativo da concentração de atenção em boxeadores, antes e depois da intervenção psicológica

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ABSTRACT

Introduction: The concentration of attention is essential in boxing, an activity where the athlete faces an opponent at close range, in a fight that takes place in a limited time, placing high demands on the attention process.

Objective: The present study aimed to compare the concentration of attention in boxers category 15 - 16 years of the Sport Initiation School (Eide in Spanish) "Mártires de Barbados" in Havana, before and after the psychological intervention of the process.

Materials and methods: The sample consisted of 20 athletes of competitive interest. The evaluation was carried out at two moments during the special preparation stage; the first before carrying out psychological intervention actions of the process and the second after eight weeks carrying them out. For the initial diagnosis, the following techniques were used: Landolt Ring Test, self-assessment scale for athletes, external assessment scale for coaches, interviews with athletes, and structured observation of training and competitions. In the retest, the first three techniques mentioned were repeated.

Results: The main results initially obtained were a concentration evaluated as bad and regular in 50 % and 40 % of the sample, respectively, expressed mainly in the repetition of errors already corrected by the coaches and in difficulty in maintaining focus. Post-intervention, an improvement in attention concentration was verified, obtaining a diagnosis of good, very good and excellent in 35 %, 20 % and 20 % of the sample, respectively.

Conclusions: It is concluded that the proposed intervention contributed to an improvement in the diagnosis of the process.

Keywords: Boxers; Concentration of attention; Initial diagnostic; Comparative study; Retest.

RESUMEN

Introducción: La concentración de la atención es fundamental en el boxeo, actividad donde el deportista se enfrenta a un contrario a corta distancia, en un combate que transcurre en un tiempo limitado, planteándole elevadas exigencias al proceso de atención.

Objetivo: El presente trabajo tuvo como objetivo comparar la concentración de la atención en boxeadores categoría 15 - 16 años de la Eide "Mártires de Barbados" de La Habana, antes y después de la intervención psicológica del proceso.

Materiales y métodos: La muestra fue de 20 deportistas de interés competitivo. La evaluación se realizó en dos momentos durante la etapa de preparación especial; el primero antes de realizar acciones de intervención psicológica del proceso y el segundo luego de ocho semanas realizándolas. Para el diagnóstico inicial se utilizaron las siguientes técnicas: Test de Anillos de Landolt, escala de autovaloración a deportistas, escala de valoración externa a entrenadores, entrevista a deportistas y observación estructurada a entrenamientos y competencias. En el retest, se repitieron las tres primeras técnicas mencionadas.

Resultados: Los principales resultados arrojados inicialmente fueron una concentración evaluada de mal y de regular en el 50 % y 40 % de la muestra respectivamente, expresadas fundamentalmente en reiteración de errores ya corregidos por los entrenadores y en dificultad para mantener la focalización. Post intervención se comprobó una mejora de la concentración de la atención, al obtenerse un diagnóstico de bien, muy bien y excelente en el 35 %, 20 % y 20 % de la muestra respectivamente.



Conclusiones: Se concluye que la intervención propuesta contribuyó a una mejoría en el diagnóstico del proceso.

Palabras clave: Boxeadores; Concentración de la atención; Diagnóstico inicial; Estudio comparativo; Retest.

SÍNTESE

Introdução: A concentração da atenção é fundamental no boxe, uma atividade onde o atleta enfrenta um adversário a curta distância, em um combate que ocorre em um tempo limitado, colocando altas exigências no processo de atenção.

Objetivo: O objetivo deste estudo foi comparar a concentração de atenção nos boxeadores da categoria "Mártires de Barbados" Eide em Havana, antes e depois da intervenção psicológica do processo.

Materiais e métodos: A amostra consistiu de 20 atletas de interesse competitivo. A avaliação foi realizada em dois momentos durante a fase de preparação especial; o primeiro antes de realizar as ações de intervenção psicológica do processo e o segundo após oito semanas de realização das mesmas. Para o diagnóstico inicial, foram utilizadas as seguintes técnicas: Landolt's Ring Test, escala de auto-avaliação para atletas, escala de avaliação externa para treinadores, entrevista com atletas e observação estruturada de sessões de treinamento e competições. No novo teste, as três primeiras técnicas mencionadas acima foram repetidas.

Resultados: Os principais resultados mostraram inicialmente uma concentração fraca e justa em 50% e 40% da amostra respectivamente, expressa principalmente na repetição de erros já corrigidos pelos treinadores e na dificuldade de manter o foco. Após a intervenção, verificou-se uma melhora na concentração da atenção, obtendo-se um diagnóstico de bom, muito bom e excelente em 35%, 20% e 20% da amostra, respectivamente.

Conclusões: Conclui-se que a intervenção proposta contribuiu para uma melhoria no diagnóstico do processo.

Palavras-chave: Boxers; Concentração de atenção; Diagnóstico inicial; Estudo comparativo; Reteste.

INTRODUCTION

"The concentration of attention or paying attention to what we are doing and what is happening, is a determining factor in sports performance" (Suárez et al., 2018, p. 5). "The development of the concentration of attention favors security, confidence, self-esteem, emotional control, compliance with the tactical thinking plan and self-knowledge" (Álvarez, 2020, p. 458-459).

"Attention-concentration is a psychological ability related to the phases of the motor process of any sports development, since it influences the coding of external or internal stimuli, in the selection and organization of the motor response and in its execution" (González et al., 2016, p.78).

In this sense, Blanco and López (2020), establish that,

"The athlete achieves his best sports performance, when despite his technical-tactical and physical preparation, he manages to maintain an adequate level of



concentration of attention in the sports activity he performs" (p. 1213-1214). According to these authors, its study and understanding by the main stakeholders in the sports training process is eminent.

On the other hand, *Suárez et al. (2018)* point out that

"The best levels of execution are achieved when athletes are placed in an area where attention is totally directed to the execution process and nothing else, that is, focused on the relevant factors, and away from negative thoughts and other forms of distraction that impair performance. (p.5)

González and Rabilera (2016, p. 108) state that, "the attention process is closely related to sensations, perception, thought and memory, acquiring particular importance in mental functioning".

This criterion is shared by *Pérez - Iznaga et al. (2021)*, who refers that "one of the psychological variables related to sports performance, is that referred to attention as a voluntary mental activity, consciously directed and closely related to sensations, perceptions, thought, memory". (p.178).

Both researches coincide in considering that the study of attention and concentration of attention is considered essential to guarantee the effectiveness of sports activity, hence its relevant role in current research in the field of sports.

A review of the theme in different sports allows to appreciate that the studies carried out in relation to the theme have addressed the importance of the psychodiagnosis of the concentration of the athlete's attention in training and competitions; as well as psychological intervention, with the aim of seeking an improvement in its behavior in athletes of various categories (*Soler and Suárez, 2015; Del Monte, 2017; Lorenzo et al., 2018; Pérez et al., 2018; Suárez et al., 2018; Dongoran et al., 2019; Blanco and López, 2020; Cañizares et al., 2020; Gónzález-Guirval, et al., 2020; Olmedilla et al., 2021; Pérez-Iznaga et al., 2021; Jaramillo, 2022*).

The study of attentional processes in the sports field cannot go against the elements that typify this activity, and even less so with the psychological demands that each of the sports have (*Pérez et al., 2018; Suárez et al., 2018*). Within the combat group, boxing is characterized by the body-to-body contact that is established between the opponents. Its rating is based on the subjective perception of judges and referees who award the highest score to the athlete who, according to their criteria, provides the greatest number of effective hits, during a period of time established and rigorously controlled.

The rapid and precise execution of the technical actions and tactical plans of boxing athletes is associated with the capacity they can develop to centrally direct their attention. At the same time, it is necessary that they can distribute this in the different components of their own execution and in the variations of the executions of each of the technical actions and the tactical actions of the opponent.

In them, the concentration of attention plays a primordial role in the penetration that they must be able to make on those intentions that the adversary has. In a fight with a limited period of time and a close proximity to the opponent, the boxer must look for opportunities to perform actions that could define the situation (*Soler and Suárez, 2015; Suárez et al., 2018*).





Analytical-synthetic: it allowed, through the implementation of cognitive processes, the detailed analysis of the information referring to the concentration of attention as a quality of attention. It was of vital utility in the study of the theoretical references on the subject, as well as in the analysis of data products of the research itself. It made it possible to refer to the most significant elements both in the period of diagnosis, preparation and application of the actions, as well as in the verification of their effectiveness.

Inductive-deductive: it starts from the study of attention as a general process to emphasize some of its parts, in this case the concentration of attention, and at the same time ensure that the conclusions that are arrived at enrich the elements theorists that are known about this psychological process.

From the empirical level, the following were used:

Interview (to athletes): was used to collect the state of opinion of the athletes who are members of the sample in relation to significant elements related to the concentration of attention.

Observation (during training and competitive matches): was used to corroborate the existence of the problematic situation raised.

The measurement (Landolt Ring Test, self-assessment scale for athletes and external assessment scale for coaches): were used to collect data on the current state of the process under study, as well as to collect the state of opinion of the subjects directly and indirectly involved in the research.

From the statistical-mathematical level:

For the collection of information in the field, a spreadsheet was prepared that was taken to an EXCEL database for ordering and better understanding. For the analysis of the results, descriptive statistics were applied, using the median and mode as trend measures. Additionally, the empirical distributions of absolute and relative frequencies were used with their corresponding percentage distribution for the quantitative analysis of the variables.

The Wilcoxon signed rank test was used to evaluate test and retest contrasts. The significance level used was $p < 0.05$. In addition, the non-parametric analysis of variance of Kruskal Wallis was used in order to compare the diagnostic observations. The significance level used was $p < 0.05$. For the representation of the information, tables, bar charts and pie charts were used. For statistical processing, the statistical package SPSS 22.0 for Windows was used.

Prior to the beginning of the field work, the sample was selected according to established inclusion and exclusion criteria. Once the sample was selected, informed consent was requested from all the research participants. In this way, an ethical procedure was guaranteed for both parties throughout the process.

From a population of 40 boxers, the sample of the present research was made up of 20 boxers, all male in an age range of 15-16 years, with an average chronological age of 15.7 years. The sporting age of the members was between 2 and 5 years old, with an average sporting age of 2.8 years.



To carry out this diagnosis, a combination was established between the criteria produced by a standardized test for the measurement of this variable, the criteria of the athletes involved, the criteria of their coaches and the assessment of the psychologist responsible for the research. To this end, the Landolt Ring Test, a self-assessment scale for athletes, an external assessment scale for coaches, and structured and participant observation in both training and competition were used.

To carry out the research, the concentration of attention is taken as a dependent variable, which is defined in terms of the stability and intensity of its orientation towards a given object or stimulus. The independent variable is the actions of psychological intervention for the concentration of attention in boxers of the category 15-16 years of the Eide "Mártires de Barbados" in Havana and is defined as the set of actions of psychological intervention to promote concentration care, elaborated from the diagnosis made.

The research took place during the special preparation stage, as it is recognized in the literature that as the athlete's preparation stages progress, the concentration of attention reaches its best results. The moment of application of the tests was the mornings for a better performance of the athlete, before or after the training sessions, according to the requirements of each test.

Work was carried out in a closed place with adequate conditions of privacy, lighting, ventilation, as well as the necessary material conditions for their comfortable application. The field tests were carried out at the training site. Fieldwork sessions last 1 hour, starting at 10:30 am and ending at 11:30 am.

The research was carried out in four stages:

Diagnosis stage (first application of evaluation instruments).

In this case, a total of five evaluation instruments were carried out. They were:

Semi-structured interview with the athlete: individual.

Objective: to investigate the self-assessment that the athlete has in relation to their levels of concentration of attention.

Observation: three in training and two in competitive peaks, usual conditions for carrying out the sports activity, no control of the intervening environmental variables: noise, heat, quality of the equipment.

Objective: to corroborate the existence of indicators of low concentration of attention raised in the problematic situation.

Landolt Ring Test: 30 minutes before starting the training session.

Objective: to evaluate the current state of the concentration of attention that the boxer possesses.

Self-assessment scale for athletes: individual, 30 minutes after the end of the session.

Objective: to deepen the self-assessment that the athlete has in relation to their levels of concentration of attention.



External assessment scale for coaches: individual to each coach responsible for the individual preparation of athletes, both before and after training.

Objective: to explore the evaluative criteria of the coach regarding the concentration of attention of the boxers in the sample.

Stage of elaboration of the intervention actions for the training of the concentration of attention.

A total of 8 activities were elaborated based on the postulates of Cuban and foreign authors who have carried out previous work with them. For their selection, the results of the diagnosis were taken into consideration. Each of the activities has its specific actions for each phase. In this sense, the actions were organized for the development of four fundamental skills that should be fostered in athletes for attention training, they are:

- Skills concerning the attentional approach used by the athlete.
- Skills related to the preparation of the athlete's attention.
- Skills for the control of attentional interferences.
- Skills to control fatigue and pain.

Stage of application of intervention actions for training concentration of attention.

Work was carried out for eight weeks for the application of the elaborated intervention actions. The application process was divided as follows:

- Educational phase. (First and second weeks).
- Acquisition phase. (Third to sixth week).
- Practical phase. (Seventh and eighth weeks).

Stage of evaluation of the effectiveness of the intervention actions proposed for the training of the concentration of attention.

In this case, three of the techniques used in the diagnostic stage were performed as a retest and with the same objective. They were:

- Self-assessment scale for athletes.
- External assessment scale for coaches.
- Landolt Ring Test.

In this way, it was possible to assess the evolution of the variable not only from the direct test of the quality itself, but also from the opinion of the main people involved in the situation, say athlete and coach. In this case, a work session was carried out for each athlete, that is, the self-assessment scale was applied, followed by the Landolt Ring Test. Once the individual work with the athlete was concluded, the external assessment scale was applied to his coach. This procedure was followed with the 20 boxers in the sample.



RESULTS AND DISCUSSION

The results of the individual interview conducted with the athletes are shown in Figure 1 (Figure 1).

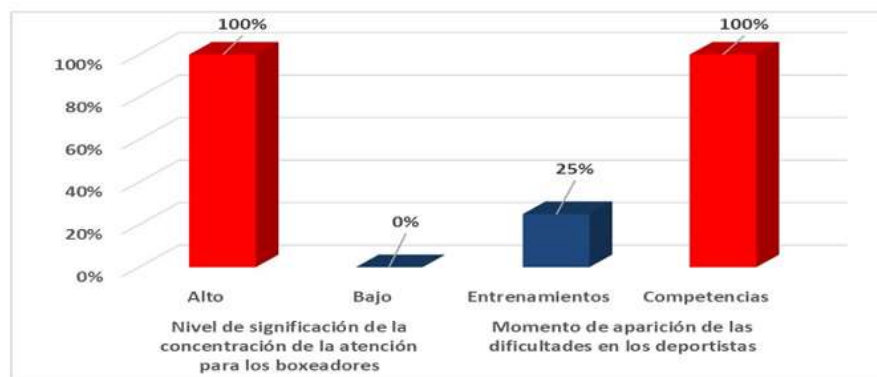


Fig. 1. - Results of the individual interview conducted with the boxers in the sample. Level of significance of the concentration of attention and moment of appearance of the difficulties in this process

The interview showed that the 20 athletes (100 %) of the sample confer a high level of significance to this psychological process for the practice of boxing. Only five athletes (25 %) of the sample reported having experienced them during training periods; the 20 athletes (100 %) in the sample associate the appearance of these difficulties with competitive situations. These elements were corroborated through the participant observation that showed the main difficulties in concentration during the third observation carried out during a competitive match. Also, in the training observations, difficulties were detected in the entire group, which indicates that there is an undervaluation of the importance of sports performance during training, and therefore, a reduced knowledge of its modeling function to face the situation. of competition.

The indicators of low concentration of attention most self-perceived by the athletes were: I let myself be provoked by the contrary in 17 athletes (85 %), I repeat the same mistakes already corrected by the coaches in 16 athletes (80 %), I listen more to the public than to my coach in 11 athletes (55 %). The indicator with the lowest level of recognition as low concentration of attention was, I get exhausted easily, indicated only by three athletes (15 %). In the case of the second and third indicators mentioned, it was possible to verify both in the observation and in the external evaluation scale that they are the ones that appear more frequently with negative values.

Regarding the behaviors assumed by the athlete in the face of the appearance of difficulties in concentrating attention, as shown in Figure 2, only two athletes (10%) reported trying to focus on the task again, while 13 (65 %) do nothing and five (25 %) get upset (Figure 2).



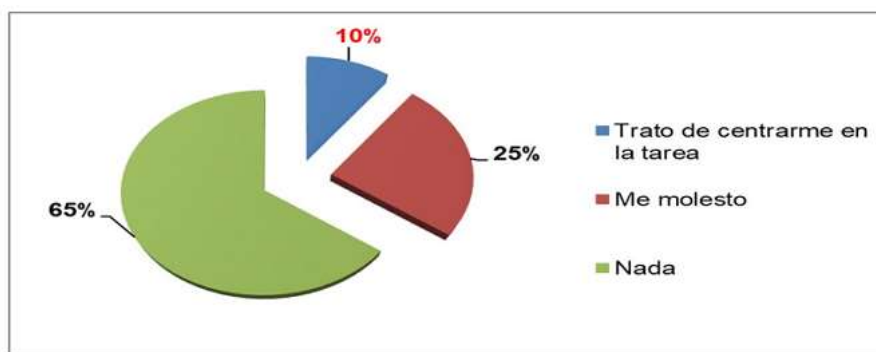


Fig. 2. - Results of the individual interview conducted with the boxers in the sample. Behaviors assumed before the appearance of difficulties in concentrating attention

In relation to the observation, it was obtained that five of the six indicators observed are evaluated as fair, only the solution time of the oriented tasks being evaluated as good. These results, together with the evaluation obtained through the Landolt Rings Test, corroborate the elements described above during the justification of the problematic situation raised by the coaches, which constitutes the one that argues the relevance of the present investigation.

Table 1 shows the descriptive statistics associated with the Landolt Ring Test, with an evolutionary character. When applying the Wilcoxon signed rank test to contrast the differences found, from the descriptive point of view, significant differences were obtained at each minute ($p < 0.05$) (Table 1).

Table 1. - Results of the test and retest of the Landolt Ring Test

Weather	Moment	Median	Significance
1st minute	Before	50.0	0.00
	After	70.4	
2nd minute	Before	60.5	0.00
	After	76.0	
3rd minute	Before	55.2	0.00
	After	82.6	
4th minute	Before	57.8	0.00
	After	79.6	
5th minute	Before	38.8	0.00
	After	78.9	

*Significance of the Wilcoxon rank test



During the initial diagnosis, there was a predominant evaluation of bad in 10 athletes (50 %) and fair in eight athletes (40 %) in relation to this process, with a correspondence between the criteria of athletes, coaches, the results of the test provided in this sense and the elements thrown by the observation. The minutes with the highest concentration of attention were the second and the fourth, while those with the lowest were the fifth and the first (Figure 3).

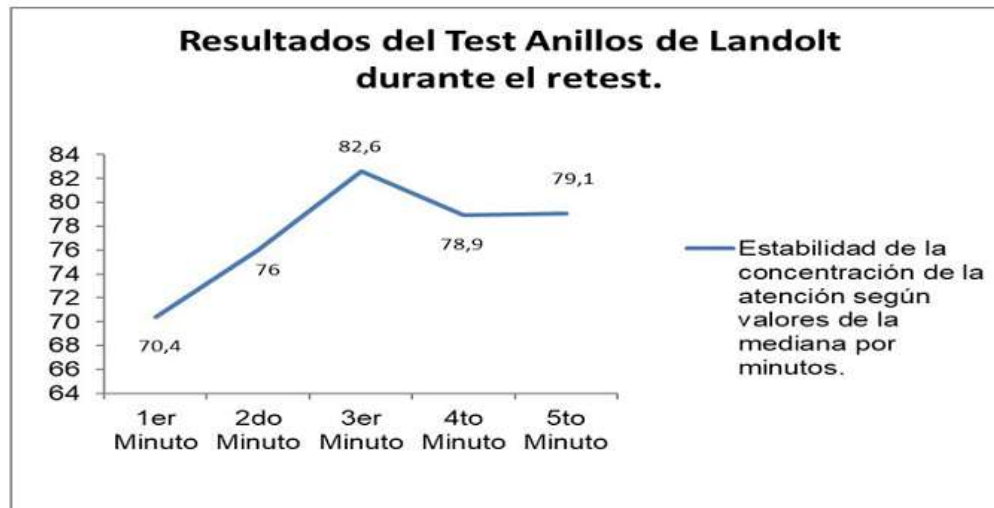


Fig. 3. - Attention concentration index per minute obtained by the Landolt Ring Test during the diagnostic stage

In the final evaluation carried out after applying intervention actions, a change to the categories of good is observed in seven athletes (35 %) and very good in four athletes (20 %), with four subjects evaluated as excellent (20 %). In this case they are the 3rd., 5th. and 4th. minute (in that order) those with the best results and the 1st with the lowest (Figure 4).

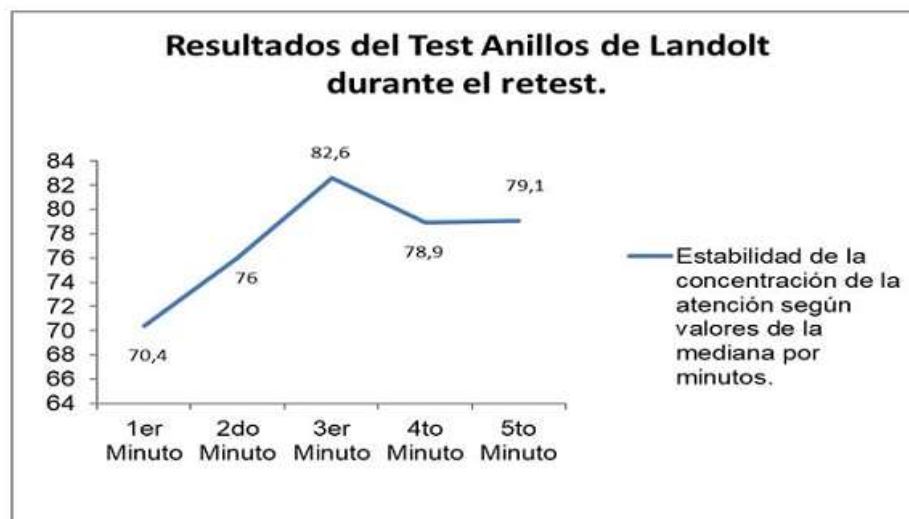


Fig. 4. - Index of concentration of attention per minute obtained by the Landolt Ring Test during the verification stage of the effectiveness of the intervention actions



An improvement in the concentration of attention can be observed during all the minutes of the test, going from an evaluation of fair in the second minute and bad in the rest during the initial diagnosis to an evaluation of good in the 1st. 2nd, 4th and 5th. and very well in the 3rd. In the curve made in this sense (Figure 4) a rising line is observed from the beginning of the test, with a slight decline in the 4th and 5th. minute.

This time the 5th. minute was even higher than the 2nd. and 4th, which indicates a development of abilities to combat the physical and psychological exhaustion that appears in situations of load, as well as the ability to maintain the concentration of attention in moments of fatigue or pain, skills that were developed with the intervention actions carried out.

Table 2 shows the evolution of the self-assessment categories used to collect the athletes' self-perception in relation to their concentration of attention (Table 2).

Table 2. - Results of the empirical distributions of absolute and relative frequencies with their corresponding percentage distribution of the self-assessment scale for athletes

Evaluative categories	Before	After
Excellent skills.	fifteen%	Four. Five%
He needs time to improve.	40%	40%
He needs special attention.	45%	15%

In relation to the self-assessment of the athletes, a significant progress was found, since the category needs special attention (45 %) predominant during the diagnosis phase, a greater number of athletes (nine) located in the excellent skills category are advanced. (Four. Five %). This element shows the athletes' understanding of their strengths and difficulties, and indicates their need to continue doing this type of work, because even when they value the existence of a positive change in this regard, the median of the group does not consider that they have achieved training. optimum in the process.

An important referent for conducting research on the concentration of attention in athletes, and more specifically in boxers, is the criteria of the boxer's individual trainer from his role as a specialist in the sporting activity in question. In this case, the results refer to the evaluation of the external assessment scale that was applied to them (Table 3).



Table 3. - Results of the test and retest of the external assessment scale

Indicators	Moment	Median	Fashion	Frequency
He makes the same mistakes after being corrected by the trainers.	Before	4.5	5	Almost always
	After	2	2	Rarely
He gives in to the provocations of his opponents and does not develop his tactical plans.	Before	3	3	Sometimes
	After	2	2	Rarely
At the moment of the fight, the noises of the public and the orientations of the coaches from the corner affect his concentration.	Before	3	3	Sometimes
	After	2	2	Rarely
During fights it seems like he's thinking about something unrelated to it.	Before	3.5	3	Sometimes
	After	2	2	Rarely
During the fight, he neglects the movements of both hands and feet of his opponents, so he is easily surprised.	Before	4.5	5	Almost always
	After	2	1	Rarely

It is evident that the retest had more discreet median values in all the items evaluated. Changes were found in the responses, more marked in the first (he makes the same mistakes after being corrected by the trainers) and in the last (during the fight he neglects the movements of both hands and feet of his opponents, so he is easily surprised). These marked changes are evidenced by the variation in the value of the mode from five to two (almost always to almost never) in the first item and from five to one (almost always to never) in the last item. In the remaining items, the mode varies in a more discreet way but always in a positive direction, in this case the values range from three to two (sometimes almost never).

When referring to the two aforementioned indicators, it is significant to highlight the fact that the coaches perceive a positive change of such magnitude, since they are the elements that in their practical actions they reiterate most frequently when they argue their consideration of the existence of difficulties in this psychological process.

In general, it can be seen that the evaluations that are repeated the most during the diagnosis stage (mode) are almost always and sometimes, while in the retest stage the criteria of the trainers shift fundamentally to evaluations of almost never and never, which represents a perception on his part of a step forward in the training that has been carried out for this process.

When performing the Wilcoxon rank test to evaluate the contrast for each item between the initial diagnosis and the retest, significant differences were found for all items ($p=0.00$) at the $p<0.05$ level.



The results obtained in the research show the existence of greater difficulties in concentrating attention at the beginning of activities that demand greater effort from the athlete. In this case, the low levels of concentration existing at the beginning of a new activity that challenges the will of the athlete, are in correspondence with previous studies carried out by [Del Monte \(2017\)](#), who refers to results found in judo athletes in training in height, in 1998 and 1999 and states that in both the Landolt Rings Test (1998) and the Grid Test (1999) differences in attention (concentration) are observed in the following periods: before leaving and after three days of stay (less concentration), seven days of stay (already better than before leaving), fourteen and twenty-one days of stay (more or less the same results for these two moments of study, but with a great improvement compared to before leave for height).

As can be seen in the results of the research, when carrying out the second evaluation, significant differences were found in all the tests, an element that indicates the positive influence that the performance of intervention actions for the training of the concentration of the concentration exerts on the athletes. attention during the sports training process. This advance in concentration is in correspondence with studies carried out by [Del Monte \(2017\)](#) who states that as the preparation stages go by, attention concentration improves, as well as with the results achieved by [Álvarez \(2020\)](#), who expresses as a conclusion of his research that "the actions developed for the concentration of attention in accordance with the needs expressed by the athletes constituted an alternative, which favored the fulfillment of the proposed objective and the promotion to higher levels" (p. 459).

Similar results have been reported by [Blanco and López \(2020\)](#) in research carried out in another combat sport, specifically fencing. According to these authors, once the diagnosis is concluded, 95 % (19 athletes) of the sample have traits of inattention and 70 % (14) fall into the category of attention deficit, which is consistent with the results obtained in the questionnaire applied to the coaches of said athletes and with the behavior reported by them in training. These results varied favorably once the intervention actions were applied.

This scientific result corresponds to the criteria of researchers on the subject in different sports who defend the current need to increase programs, strategies, models, intervention alternatives that provide tools for systematic psychological training. These methodological tools must be specifically designed so that athletes can control and therefore improve their mental abilities, among which the concentration of attention stands out. ([Dongoran et al., 2019](#); [Álvarez, 2020](#); [Blanco and López, 2020](#); [Olmedilla et al., 2021](#)).

CONCLUSIONS

In the current research with boxers category 15 - 16 years of the Eide "Mártires de Barbados" in Havana, the application of intervention actions during the preparation of the athlete contributed to an improvement in the diagnosis of the concentration of attention.

The diagnosis of concentration of attention reached the categories of good, very good and excellent in most of the boxers studied during the final evaluation.



The work with the boxers of Havana during their stage of sports specialization, highlighted once again the need to continue developing research, which theoretical and practical contributions provide the sports coach and the athlete himself with tools that enable them to face and overcome the difficulties that, in relation to the concentration of attention, appear during sports activity.

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