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Methodology to increase reaction speed during self-defense in cadets

Metodología para incrementar la velocidad de reacción durante la defensa personal en cadetes

Metodologia para aumentar a velocidade de reação durante a autodefesa em cadetes

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ABSTRACT

Physical preparation, as part of training of the cadets, seeks to put the practitioner in optimal condition, perfects their natural aptitudes and develops their physical capabilities to the maximum through systematic exercises. In this sense, the speed of reaction during self-



defense is an important aspect to address; however, the observation and analysis of the educational reality at the Institute of Higher Education of the Ministry of the Interior, in Santiago de Cuba, revealed insufficiencies that limit the achievement of high levels in reaction speed. The objective of the study was to develop a methodology for the development of reaction speed during self-defense, in the cadets of the State Security Sciences career of the Ministry of the Interior. In this line of thought, research was carried out with a mixed approach and quasi-experimental design that used documentary review, scientific observation and unstructured interviews as empirical methods; inferential statistics was used through the Wilcoxon rank test for related samples, which made it possible to know the efficiency of the special exercises that were applied. The quality of the methodology was corroborated by the results obtained in the application of expert criteria in the "Delphi" variant and of the pre-experiment, confirmed by different statistical techniques that highlight the functionality, sustainability, relevance and feasibility of the proposal.

Keywords: cadets, self-defense, reaction speed.

RESUMEN

La preparación física, como parte del entrenamiento de los cadetes, busca poner en óptimo estado al practicante, perfecciona sus aptitudes naturales y desarrolla al máximo sus capacidades físicas por medio de ejercicios sistemáticos. En ese sentido, la velocidad de reacción durante la defensa personal constituye un importante aspecto a tratar; sin embargo, la observación y análisis de la realidad educativa en el Instituto de Enseñanza Superior del Ministerio del Interior, en Santiago de Cuba, reveló insuficiencias que limitan el logro de altos niveles en la velocidad de reacción. El objetivo del estudio consistió en elaborar una metodología para el desarrollo de la velocidad de reacción durante la defensa personal, en los cadetes de la carrera Ciencias de la Seguridad del Estado del Ministerio del Interior. En esa línea de pensamiento, se realizó una investigación con enfoque mixto y diseño cuasi experimental que empleó como métodos empíricos la revisión documental, la observación científica y la entrevista no estructurada; se utilizó la estadística inferencial por medio de la



prueba de rangos de Wilcoxon para muestras relacionadas, lo que permitió conocer la eficiencia de los ejercicios especiales que se aplicaron. La calidad de la metodología quedó corroborada por los resultados obtenidos en la aplicación del criterio de expertos en la variante "Delphi" y del preexperimento, confirmados por diferentes técnicas estadísticas que resaltan la funcionalidad, sostenibilidad, pertinencia y factibilidad de la propuesta.

Palabras clave: cadetes, defensa personal, velocidad de reacción.

RESUMO

A preparação física, como parte do treinamento dos cadetes, busca colocar o praticante em ótimas condições, aperfeiçoar suas aptidões naturais e desenvolver ao máximo suas capacidades físicas por meio de exercícios sistemáticos. Nesse sentido, a velocidade de reação durante a defesa pessoal é um aspecto importante a ser abordado; no entanto, a observação e a análise da realidade educacional no Instituto de Ensino Superior do Ministério do Interior, em Santiago de Cuba, revelaram insuficiências que limitam a obtenção de altos níveis de velocidade de reação. O objetivo do estudo foi elaborar uma metodologia para o desenvolvimento da velocidade de reação durante a autodefesa, em cadetes do curso de Ciências de Segurança do Estado do Ministério do Interior. Nessa linha de pensamento, foi realizada uma pesquisa com abordagem mista e desenho quase experimental, utilizando como métodos empíricos a revisão documental, a observação científica e a entrevista não estruturada; foi utilizada a estatística inferencial por meio do teste de postos de Wilcoxon para amostras relacionadas, o que permitiu conhecer a eficiência dos exercícios especiais aplicados. A qualidade da metodologia foi corroborada pelos resultados obtidos na aplicação de critérios de especialistas na variante "Delphi" e no pré-experimento, confirmados por diferentes técnicas estatísticas que destacam a funcionalidade, a sustentabilidade, a relevância e a viabilidade da proposta.

Palavras-chave: cadetes, defesa pessoal, velocidade de reação.



INTRODUCTION

Physical preparation constitutes one of the most important components in the training of cadets of the Higher Education Institute of the Ministry of the Interior (MININT) in charge of maintaining internal order in Cuba. These agents ensure the security and sovereignty of the people; they must be in optimal physical condition to confront crime and maintain citizen tranquility during their professional actions. For these reasons, the topic addressed is recurrent, necessary and directly related to physical activity and sport; it is considered within it the requirement to increase the level of military physical preparation and, in particular, the speed of reaction necessary for efficient performance in the professional performance of cadets who are preparing as future officers.

The importance of self-defense for the cadets of the MININT Higher Education Institute and the need to update, from a methodological point of view, said training scenario, forces to resort to the scientific study of the works of various authors who have addressed similar topics. Among others, Salfrán -Vergara and Figueredo- Salfrán (2020) are found, who from their studies of volleyball, consider physical preparation as the training that a person develops to be able to perform a certain activity, through certain exercises and a healthy nutrition.

On the other hand, Rivera-Arturo (2023) refers to the main trends in physical preparation, particularly in football, and highlights the importance of personalization, strategic planning, a comprehensive approach to training and adequate nutrition. Meanwhile, Bondarenko *et al.* (2020) refers to criteria to evaluate the physical preparation of patrol police officers when carrying out activities in which their functional potential and physical qualities are developed to the highest levels. This analysis allows to summarize that physical preparation constitutes a subprocess of training whose objective is to achieve and establish the physical condition of a person, so that they can give the best of themselves during the course of a specific activity.



Correspondingly, it should be considered that physical preparation allows the optimal adaptation of the different organs and functional systems of the human body to face the physical and psychological tensions inherent to the activity carried out by the athlete. Likewise, these aspects are essential in the comprehensive training of state security cadets due to the similarity of objectives between both preparations; therefore, it is agreed with Muñoz-Hernández (2021) who considers it as a starting point in the development of the individual, in the search to form bases for motor, conditional, and coordinative capacities and as a step that enables the fulfillment of the activity in the context where it develops.

On the other hand, it is important to specify that speed is one of the conditional capacities that physical preparation addresses and one of its combinations with reaction gives rise to reaction speed; this type of speed is one of the ones that contributes the most to the practice and professional performance during self-defense in MININT cadets. Speed is another important concept related to the topic being addressed, in that sense, Calero-Morales and González-Catalá (2015) define it as "(...) the capacity of the individual to execute different movements or motor actions to the maximum of speed in the shortest time" (p.54). In turn, these authors consider that one of the ways in which speed is manifested is the reaction speed. Pila- Telen and Novoa-López (2020) consider speed as the capacity to produce a large acceleration at the beginning of the advance and to maintain it for the maximum possible time to reach the highest speed. It is the capacity of the individual to move from one place to another in the shortest possible time.

Reaction speed is a capacity that is usually lost at an early age. At age 25, the first symptoms of aging begin to appear and its level progressively decreases until age 45; this capacity covers the recognition of the situation, the elaboration of the response and the most effective movement order and is necessary in cadets to improve performance in operational actions, since it allows maintaining a high speed of execution during the time in which the operational action takes place.

Such definitions allow to summarize that the reaction speed is the capacity of the athlete to respond quickly to a specific stimulus, so the speed can be manifested as reaction speed and



be adapted didactically for learning content to improve the physical exercise of the cadets during their combat preparation.

On the other hand, Tudela-Esparza (2019) considers that self-defense is a combat discipline that has significant importance due to the benefits it brings to the individual and collective development of the members of the group of cadets and improves the mental and physical conditions of the practitioners. Hernández-López and Téllez-González (2021) report that the Particularity of this combat discipline requires practitioners to have a high level of physical performance to meet the results in the planned preparation that are not possible without adequate planning of the physical load.

Precisely, this constitutes a fundamental element that governs the training of cadets, given that self-defense occupies an important place in their preparation for confrontations; this provides them with a coherent theoretical, psychological, physical, technical, tactical and combative integration for their professional performance, based on the formation of a general culture that makes it easier to meet the demands demanded by society at the present time.

According to Alvarado- Zedeño *et al.* (2022), military-physical preparation includes numerous assumptions that regulate the operational readiness of military personnel, establishes basic standards for all active life and allows improving or maintaining physical condition. In this way, the cadet must acquire sufficient physical preparation to defend himself against any attacker; In this sense, the actions to be carried out are fundamentally based on the development of speed elements to react without using weapons, while trying not to be the aggressor, but rather the defender.

In the case of self-defense, the reaction speed of the upper body is evaluated based on rapid force, for which the Richer Bauer test can be used, a method that evaluates the reaction speed between the eye and the hand in most operational operative action. The reaction speed in volleyball, according to Salfrán -Vergara and Figueredo- Salfrán (2020), is evaluated in the subject's dominant hand. In the research carried out, the use of both hands in the execution is taken into account; it is recommended to always evaluate both hands, even the hand that is not dominant in the athlete.



Another example is the evaluation of reaction speed through the Galton test that measures the simple reaction time to a visual stimulus; for this, the following materials are used: rod or (cane) graduated in cm. Length 60 cm, diameter 2.5 cm and approximate weight 0.5 kg. The scale starts 5 cm from one end of the stick. The performer sits in a chair, rests the most skilled (dominant) arm on a flat surface, the wrist should be 5 cm from the edge of the flat surface, the palm of the hand towards the midline of the body, the fingers semi-extended, thumb separated, hand semi-closed and eyes fixed on the cane.

The evaluator stands in front of the performer and places the cane in front of the space left by the hand, making the zero of the measurement scale coincide with its upper edge. The examinee must keep his eyes on the cane near his hand, then is alerted with the word "ready" before dropping the cane within the next three seconds (the count is done by the evaluator slowly) and tries to catch the cane as quickly as possible. The reference point for the measurement is the upper part of the hand at the first joint of the index finger, there it is placed at zero before releasing it and the measurement is taken when it is caught and the distance that coincides with the upper edge of the hand is recorded in cm and millimeters.

The research carried out has as objective to develop a methodology for the development of reaction speed during self-defense, in the cadets of the State Security Sciences career of the Ministry of the Interior, at the Santiago de Cuba Institute.

MATERIALS AND METHODS

To carry out the research, a mixed approach was used with emphasis on the quasi-experimental study. Likewise, different research methods and techniques were used, which are mentioned below.

With the scientific observation method, it was possible to appreciate the behavior of the physical skills and capacities of the cadets throughout the research and the final behavior, after applying the proposed methodology. Through the unstructured interview, it was possible to know the mastery of the contents by the teachers and cadets, which allowed to propose better methodological routes in the teaching-learning process. The documentary



review method was also used, which allowed to know the structure and contents of the documents studied that govern the training process of the cadets and the non-existence of a methodology that took into consideration the scientific regulation of the personal defense process of the cadets of the security of the state.

In this sense, indicators and evaluative criteria were determined for the development of a methodology that would contribute to solving the problem, such as:

Objectivity: if the methodology contributes to the development of physical capacity, reaction speed, meets the proposed objective, is relevant and feasible for its application.

Originality: if there is precision in the guidelines for the methodological treatment of the actions inherent to self-defense to be developed at each stage and that these actions are more than 80 % novel.

Quality: if the stages declared in the methodology for structuring the process express its functionality, effectiveness and relevance in an adequate logical order and if, in general, it is considered a document worthy of being taken as a standard by which the preparation of the personal defense of cadets.

In turn, the theoretical systematization of the categories: reaction speed, auditory and visual reaction time, self-defense and cadets served as support for the definition of the variable to be transformed (Table 1).



Table 1.- Variable, research dimensions and indicators

Variable	Dimensions	Indicators
Reaction speed in the personal defense of cadets	Cognitive	Cadet's knowledge of the definitions of self-defense, reaction speed, and auditory and visual reaction time Types of self-defense Knowledge that the cadet has about the importance of reaction speed in personal defense
	Teaching preparatory	Attention to the cadet from classes and training to increase reaction speed
	Performance in professional activity	Preparation actions received by cadets to increase reaction speed Importance that the cadet gives to the increase in reaction speed Actions carried out by the cadet to increase the speed of reaction in self-defense. Assessment of the actions applied to the cadet to increase reaction speed in self-defense

The speed of reaction in the self-defense of cadets is defined as the cadet's capacity to respond quickly to a specific stimulus during the execution of self-defense actions in the fulfillment of their social task: maintaining internal order and citizen tranquility. In the research, it was assumed as a dependent variable.

The cognitive dimension referred to the cadet's knowledge of self-defense, reaction speed, auditory and visual reaction time; the teaching preparatory dimension described the preparation received by the cadet to increase the reaction speed in self-defense and the performance dimension in the professional activity offered the cadet's assessment of the preparation to increase the reaction speed in self-defense, as well as the response offered, from personal defense, in his performance as protector of internal order and citizen tranquility.

Statistical and mathematic methods were used, including descriptive statistics that was applied to collect, organize, analyze, interpret and represent the information with in order to describe its characteristics, based on the percentage calculation, graphs and tables. The inferential statistics, through the Wilcoxon rank test for related samples, allowed to know the efficiency of the special exercises that were applied.



The expert criteria in the "Delphi" variant made it possible to assess the relevance, effectiveness and feasibility in the application of the methodology. Its behavior with respect to structuring and content was also assessed, as well as the quality of the exercises proposed to improve reaction speed. On the other hand, the pre-experiment allowed to compare and define the quality of the special exercises proposed in the methodology, in two main moments: pre-test and post-test.

The research took place at the Higher Education Institute of the MININT, in Santiago de Cuba. The population of the fourth and final year of the State Security Sciences degree program (50 cadets) and four Personal Defense teachers from that school year were selected. The ages of the cadets ranged between 18 and 25 years, male.

The institution's facilities, sports areas and physical training ranges, personal defense tatami mats were used, as well as sports materials, specialized implements (machetes, knives, blunt objects, ropes, real and instructional pistols and rifles), and materials specific to the teaching-learning process for teaching.

RESULTS AND DISCUSSION

To diagnose the current state of the reaction speed in the personal defense of cadets, the aforementioned methods were used. Once the observation guide and the review of documentary sources of the State Security Sciences career were applied, the following conclusions were reached:

- The Personal Defense subject program does not have a methodological guide that prepares teachers to develop the physical capacity speed of reaction in cadets.
- The cadets have deficiencies in the physical capacity speed of reaction during self-defense classes.
- The study programs do not always adapt to the demands of the real results provided by the evaluations of the pedagogical tests whose contents address the cadet's preparation during self-defense classes.



On the other hand, the unstructured interview that was applied to these teachers reflected that 100 % of them recognize the need to increase the speed of reaction, due to the characteristics of the professional activity carried out by the cadets in their social work as protectors of order.

At the same time, the results of the unstructured interview with cadets are shown regarding their preparation for increasing the speed of reaction, according to the indicators of the Preparatory Teaching dimension (Figure 1).

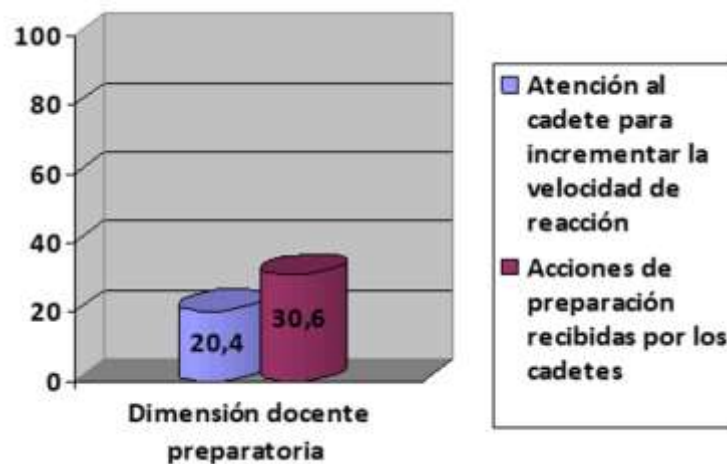


Fig. 1. - Results of the unstructured interview with the cadets regarding preparation for increasing their reaction speed. Preparatory teaching dimension

When analyzing the results, the insufficient preparation that the teachers and cadets received to increase the speed of reaction was evident, which corroborates the research problem and the need for a methodology as an alternative solution. The methodology to increase the reaction speed during self-defense in cadets was structured in the following stages:

1. Diagnósis.
2. Planning.
3. Application.
4. Evaluación.



These stages are specified in the instrumental apparatus of the methodology, with the system of actions and methodological guidelines, in which the use of sports training methods and the application of procedures to develop the speed of reaction in the cadets are privileged.

Results of the theoretical feasibility study using the application of the expert judgment method

The expert criteria in the "Delphi" variant was applied in two rounds to know the considerations and criteria of the experts about the efficiency of the methodology, its relevance and feasibility, the quality of the order of its stages, as well as the exercises. special ones to increase the speed of reaction in the personal defense of the cadets. The analysis of the first round included a proposal with eight physical reaction speed exercises, based on the principle of specialization and the vision of self-defense training; the second moment of analysis was applied after the proposed items and exercises had been submitted to the experts' judgment and their suggestions had been taken into account, where a correction was made to the errors and insufficiencies detected in the first round. In addition, they had to assess the efficiency, relevance and feasibility of the methodology.

Characterization of the experts:

Of 13 possible expert candidates, the 11 who met the established requirements and achieved high levels of competence were selected.

Inclusion criteria:

1. Possess work experience in personal defense of 15 years or more.
2. Have been linked to the physical preparation of students or athletes for ten years or more.
3. Have a master's or doctor's degree in science.
4. Be willing to carry out the investigation.



Additionally, a test based on ten points was carried out, to select the experts according to the required requirements, a self-assessment was carried out that excluded candidates who did not reach the minimum score of eight points. Some of the main exercises *proposed* to be evaluated by the expert judgment method were (Table 2):

Table 2. - Representation of exercises of the proposal for the development of reaction speed in MININT cadets

No	Exercises
1	Defense against a subject who tries to attack with an object from behind.
2	Defense against a subject who tries to attack with a sharp piercing object from the front.
3	Defense against a subject who tries to grab a nearby weapon on the ground.
4	Defense against a subject who tries to grab us by the neck from the front. Variant: grab from behind.
5	Defense against a subject who tries to extract a weapon from his clothes.
6	Defense against a subject who tries to finish off with a blunt object while the cadet is on the ground.
7	Cadet's reaction to the throwing of six balls ...

It was applied to each point as described below:

1. 4.1-5.0 points: Excellent (E).
2. 3.1-4.0 points: Good (B).
3. 2.1-3.0 points: Fair (R.)
4. ≤ 2 points: Bad (M).

The Wilcoxon rank test was applied, available in the SPSS statistical package, version 22, with a significance level $\alpha = 0.05$ that meets the statistical condition $p \text{ value} \leq 0,05$, where H_1 is accepted: $p \text{ value} \leq \alpha$. To compare the evaluations carried out by the experts in the two rounds or moments, the specialized physical exercise plan was designed and the Wilcoxon rank test was implemented ($p \leq 0.05$), as there was no normal distribution of the data.



Results of expert judgment

Table 3. - Quantitative and qualitative assessment issued by experts about the efficiency of the methodology

Items	Objectivity		Originality		Quality		Specialization	
	1st. round	2nd round	1st. round	2nd round	1st. round	2nd round	1st. round	2nd round
Rounds of Experts								
1	5	5	4	5	4	5	4	5
2	5	5	5	5	4	5	4	5
3	4	5	5	5	5	5	5	5
4	4	5	4	5	5	5	4	4
5	5	5	5	5	4	5	5	5
6	5	5	5	5	5	5	4	5
7	5	5	5	5	4	5	5	5
8	5	5	4	4	5	5	4	5
9	5	5	5	5	5	5	5	5
10	5	5	4	5	4	5	5	5
11	5	5	5	5	5	5	4	5
∑	53	55	51	54	fifty	55	49	54
x	4.8	5.0	4.6	4.9	4.5	5.0	4.4	4.9

Table 2 shows the data obtained from the evaluation carried out by the experts in the two evaluation rounds of the proposal as a methodology. In the first item on *objectivity*, there were two experts who gave a rating of 4.8 points in the 1st round (E), which brought with it an average of 4.8, which, although considered (E), infers that there was a slight disagreement among the experts, already in the second round 100 % considered this aspect as (E). It was suggested to increase the number of exercises proposed.

In the *originality* item, the quantitative and qualitative value was 4.6 points in the first round, while in the second it reached 4.9, (E) in both cases, but with higher quality in the second round, where suggested improving the methodological actions, bringing them closer to the real conditions of the available study material base and having greater precision in the descriptions of the proposed exercises.

In the third item about *quality*, the experts considered (E) in both cases, 4.5 for the first round and 5.0 for the second, with 100 % acceptance. The quality was evident in the final general



assessment in a positive way, with a logical order and structured in a scientific way, and as a document suitable for being put into practice.

In the fourth item of *specialization*, an average score of 4.4 points was given initially and 4.9 in the second round, in both (E), but significantly higher in the second. It was suggested in two of the proposed exercises to bring them closer to the reaction speed; which was taken into account for the second round, hence its better quality and level of specialization. The above demonstrates the efficiency and consideration made to the criteria issued by the experts, for the sake of increasing the quality in the reaction speed of the cadets during self-defense in operational actions, since in all items the difference in quality does not was higher, because the presentation of the initial round was also considered as (E); however, there was a significant improvement when what was suggested by the experts was taken into account and applied.

When comparing the data obtained in the four qualifying items (Table 3), significant differences were evident in favor of the second round, as established by the Wilcoxon rank test for related samples, which allowed the methodological validation of the exercises proposed for improve reaction speed in cadets.

Different primary research sources cited previously were taken into consideration as theoretical-practical support, which allowed greater precision of the study carried out. For example, authors such as Hernández-López and Téllez-González (2021) refer to the particularity of self-defense and require practitioners to have a high level of physical performance, but do not emphasize the technical aspects so much to counterattack and defend against an adversary. Meanwhile, Richer -Bauer (cited by Salfrán -Vergara and Figueredo- Salfrán, 2020) direct their studies more towards the technical and provides elements that refer to the way of using both hands, the opposite hand and eye-hand control in order to improve efficiency in physical actions.

The points raised about the Galton test were taken into account, which emphasizes the actions to measure the reaction speed by catching a scaled cane, since it directly addresses a component aimed at the development of the specific reaction speed. for personal defense, so it was included as part of the proposed exercises with some modifications.



The research by Ramón-Suárez *et al.* (2021) should be mentioned as essential elements that offer alternatives for the study of this topic on how to measure visual and auditory reaction times, based on the establishment of interpretation scales in sports that use them, for example: speed starts in athletics (auditory reaction time) and combat sports such as taekwondo, karate, boxing, fencing (visual reaction time).

Results of the practical feasibility study through a pre-experiment

Table 4. - Behavior of the pre-experiment at the two moments of diagnosis (pre-test and post-test) to define the quality of the incident reaction speed in self-defense

No	Moments	Diagnosis-Pre test				Post test			
		MB-%	B	R	M	MB-%	B	R	M
1	Reaction to an enemy trying to draw a weapon	3=13	5	6	10	13=54	8	3	0
2	Reaction to an attack with a blunt object from the front	0=0	6	9	9	17=70	4	3	0
3	Reaction to an attack from behind with an audible warning	0=0	4	10	10	11=46	6	7	1
4	Reaction to an enemy trying to grab the neck from behind	2=8	7	8	7	10=42	2	8	2
-	Σ	5=21	22	3.3	36	54=55.20	22	twenty-one	3
-	x	1.25	5.5	8.25	9.0	12.75	5.5	5.25	0.12
-	Percentage calculation	5%	22%	35%	37%	55%	22%	22%	1.2%

As shown in Table 4, the indicators generally show a better evaluation (MB) during the post-test, where the " was 54, much higher than in the pre-test, which was only 5, as the (Mean), which reached 12.75 in the post test and 1.25 during the pretest, the same occurs in the percentage calculation. With results of 55% in the post test higher than 5 % in the pretest. On the contrary, the scores of (M) and (R) predominate during the pre-test, all significantly, which shows the higher quality achieved during the post-test, that is, after the application of the proposal with the methodology which includes special actions and exercises and allowed a more favorable development of the reaction speed during the personal defense of the cadets (Table 4).



The proposal reaffirms the need to take into account the principle of affordability and specialization of physical exercise, related to the nature of progressive increase in training loads that ensures the good physical condition of the cadets and thus improves their professional performance. This consolidates the intention to develop reaction speed in cadets through the application of the proposed methodology with specialized exercises.

It can be considered that the theoretical-practical value of the studies carried out is of great importance for the development of the reaction speed necessary for the training of MININT cadets, this demands a theoretical-practical systematization of the reaction speed during combat preparation that allows greater efficiency during professional performance. Therefore, systematization demands a high degree of preparation with content adjustments to be able to carry out efficient planning of the loads, in accordance with the proposed methodology for training. Hence, special exercises are considered as a starting point to implement the implementation of physical preparation in different similar contexts, with the exception of the corresponding adaptations.

The methodological proposal to increase the speed of reaction in the practice of self-defense in cadets shows the following basic characteristics:

1. The steps and requirements established for the staged methodologies were taken into account.
2. Up to 14 special physical exercises were increased, as part of the content of physical preparation in order to enhance reaction speed.
3. Some fundamental principles of sports training were prioritized, such as the principle of individualization, the principle of specificity, the principle of consciousness, the principle of gradual increase in load, the principle of systematicity and the principle of periodization.
4. Guidelines were established to adapt the contents of sports preparation according to the needs and possibilities of the pedagogical training environment of the cadets studied.



5. The physical preparation background of each cadet and the preparation that the cadets received, their experience in sports practice, among others, useful aspects to validate the application of the necessary workloads to form an optimal physical preparation plan were defined.

For the evaluation of the items, the proposal was presented, in the second round with 14 exercises aimed fundamentally at the development of reaction speed, where for each one the name of the exercise, the objective, how it is executed, the teaching and application methods, dosage, organizational procedure for implementation, methodological indications and observations to be taken into consideration.

CONCLUSIONS

The diagnosis carried out through observation and documentary analysis allowed to determine the existence of insufficiencies in the reaction speed of the cadets and the non-existence of a methodology that would allow the development of this very important capacity during the personal defense of the cadets.

Through the actions and exercises proposed in the methodology a solution was shown to the insufficiencies indicated in the diagnosis, which led to a development in the speed of reaction during self-defense present in teaching, maneuvers, drills and professional performance of the State Security cadets.

The methodology was considered satisfactory for the demands made during the training of the cadets and adequate because it met efficiency in terms of its structure, logical order and with specific contents according to the established indicators; in addition to being considered relevant, directed to the proposed objective and feasible due to the viable and affordable nature of its application.

The results of the assessment by the experts express the efficiency of the methodology that meets the demands of the skills and physical capabilities that personal defense demands for the professional performance of the State Security cadets.



The pre-experiment showed a significant increase in the level of reaction speed of the cadets, to efficiently confront offensive aggression in the face of different stimuli and attacks, thus meeting the objective of the research.

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The authors declare not to have any interest conflicts.

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



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