

The effect of ballistic exercises on some kinematic variables and the development of special physical characteristics for the front straight punch skill for karate juniors

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Introduction to the research :

Recent years have witnessed the emergence of many modern training methods and methods based on scientific foundations, which are intended to choose the best training methods and apply them in the most appropriate methods and means that are in harmony with the characteristics of sports activity to reach young people to advanced positions in various activities. This is what the developed countries of the world seek, as the rise The level of performance reflects the reality of properly planned training. The result is developing the physical capabilities of young people, and thus developing and raising their level of skill performance to reach international levels (١٩ :١)

The science of sports training depends on many different sciences to achieve the highest results, and biomechanics is one of these different sciences, and one of the basic pillars for developing various sports skills and helps coaches successfully complete the training process and break records (١٥:٤٥) .

From the above, the importance of biomechanics in the sports field is highlighted by assisting in the performance of sports movements that lead

to the highest level of mastery, stability and effectiveness, in addition to saving effort. These goals are achieved by knowing how to control the movement of parts of the human body during the performance of the practiced activity in order to achieve the maximum benefit. Mechanical variables that contribute to performance include time, displacement, angles, force, and energy (٨: ٨٢) .

Technical information about any skill means understanding how to perform in the light of a set of information that helps determine the motor actions required to accomplish this performance with the highest possible efficiency and the least effort. Biomechanical analysis of human movement arose as a means of identifying the rules and foundations of skill performance, as this analysis is based on its foundations. Its foundations are to enter into the depth of human performance, uncover human performance, and reveal its secrets through many testimonies, including the foundations of the contribution of body parts to increasing the effectiveness of performance in light of a mechanical environment governed by many laws (٧:١٦) (١٤:٢٤,٢٣) .

Ahmed Zahran (٢٠٠٤), citing Wells, Lutjens (١٩٧٦), and Simonen (١٩٨١), emphasizes the importance of analyzing the skill performance of players, as this is considered one of the most important factors relied upon in determining the typical specifications that must be available in a young person when guiding him during the training process. Therefore, biomechanical analysis is the objective means for evaluating skill performance in many sports activities. Researchers have relied on one of the branches of biomechanics, which are kinematic variables, which are the basis for guidance in the training process (١:٢٠١) (٢٧:٢٣٢) (٢٨:٢٣٩)

Recently, a relatively recent method called ballistic training has appeared, which is used to overcome the lack of speed resulting from traditional weight training. This is in addition to developing the working, opposing, and stabilizing muscles. It also adds movements that are characterized by increased speed to the maximum extent with the tool or weight being thrown into the body. Vacuum, it is a method in which there is no loss or decrease in speed, so it maintains the special compatibility of most games (٣:٤) .

His son Beheiry points out that ballistic training is the method in which speed and strength are developed through the full range of motion by effectively displaying the source of resistance, whether internal or external, which leads to an adaptation of the muscles so that they work in a way close to what is required of them in the specific sport. It is an important way to develop Muscular strength and the ability of muscles to perform athletic movements and overcome lack of speed (٢٢: ١٣٢٥) .

Safaa Saleh points out that ballistic training includes agility, flexibility, and stretching exercises that help increase force production and speed of muscle contraction during performance, and also develop some special physical characteristics (١٠:١٣).

Karate is considered one of the competitive sports that has spread widely due to the beauty of this sport in performance and the important personal traits it contains that seek to refine oneself. It is also one of the combat sports that has many motor skills required within the match, whether in kata or kumite. The player's success depends on the extent to which he masters these skills .

Ahmed Ibrahim points out that the sport of karate includes multiple competitions during which the junior is exposed to changing and diverse situations that require many responses. Therefore, it is necessary for the junior to possess special abilities in order to implement those responses in an ideal manner that achieves the goal of performing them (١٢٥: ٤).

The research problem and its importance :

The researchers found that, by observing (١٤٠) matches, the “Awai Zuki” front straight punch skill was successfully executed (١٢٥) times, compared to (٢٤٥) uncalculated attempts at the front straight punch skill, representing almost double the correct attempts, which shows the amount of wasted energy and effort expended. Not directed by the players during matches, and this demonstrated the importance of studying the biomechanics of the front straight punch skill .

The researchers believe that identifying the goals and characteristics of skill motor performance through conducting a kinematic analysis of the skill gives an evaluative view. The researchers also believe that there is a problem that lies in the lack of specialized training programs based on modern scientific methods through which young people can acquire and develop their level of training and skills in the shortest time. And the effort is possible .

Through objective interventions for motor skill training and increasing their effectiveness to improve motor skill performance, especially among young people practicing karate, and given the importance of the skill of the straight front punch “Aoi Zuki”, trainers and specialists have sought to reach successful training methods to raise the level of skill, and there is no doubt that special physical abilities And proficient skill performance are indispensable foundations for the success of the effective performance of this skill and one of its most important requirements. Trainers work to integrate these different elements of physical abilities with each other in order to produce a special component of two elements (special physical abilities and proficient skill performance) .

This research aims to design a proposed training program from a group of ballistic exercises and determine its impact on

:

١- Improving some kinematic variables for the front straight punch skill (Aoi Zuki) .

٢- Improving some special physical characteristics (strength characterized by speed in the arms - strength endurance in the arms - speed of the arms – agility) .

Research hypotheses:

In light of the research objective, the researchers put forward the following hypotheses:

١- There is a statistically significant effect at the level ($\alpha \leq 0.05$) of using ballistic exercises on improving some kinematic variables among junior karatekas aged ١٥-١٨ years at the Minya Sports Club.

٢- There is a statistically significant effect at the level ($\alpha \leq 0.05$) of using ballistic exercises on improving some special physical characteristics (strength characterized by speed in the arms - strength endurance in the arms - speed of the arms - agility) among junior karatekas aged ١٥-١٨ years in a club Minya Sports Club.

Terms included in the search:

- Ballistic training: It is the ability of the muscles to perform movements with the maximum possible speed at light and medium resistance (٣٠٪ - ٥٠٪). It is also characterized by an increase in speed to the maximum range with throwing the tool or weight into a vacuum. It includes weightlifting exercises with light weights and high speeds (١٧: ٢٤).
- Ballistic movement: It is the movement that is performed by the muscles but is continued by the momentum (acceleration) of the limbs (١١:٣٠).

Previous studies:

First study:

“Intisar Abbas Zidan and others” (٢٠٢٠) (٦) conducted a study under the title “The effect of a special training curriculum using the ballistic training method to develop some special physical abilities to complete the ٢٠٠-meter run for female Diyala national team players.” The study aimed to prepare a training curriculum using ballistic force and identify the effect The approach to developing the explosive power of the two men, as well as the speed characteristic of them, and the completion of the ٢٠٠m for women. In this approach, the researchers used the one-sample method with

a pre- and post-test. Physical abilities were tested and measured through codified tests approved by scientific sources. The implementation of the approach took (٨) weeks. The number of training units is (٣) per week, meaning (٢٤) training units, with a time of (٣٠ - ٤٠) minutes.

The researchers concluded that ballistic exercises have a positive impact on developing the strength characterized by speed and explosive power of the legs and the completion of (٢٠٠ m) by female athletes, and that there are statistically significant and significant differences between the pre- and post-tests for the research sample and in favor of the post-tests.

Second study:

“Hamid Abdel Shahid Hadi et al” (٢٠١٩) (٩) conducted a study under the title “The effect of plyometric exercises on developing strength characterized by speed, strength endurance of the arms, and straight punch performance among young boxing players.” The study aimed to identify the effect of plyometric exercises in developing the strength characterized by speed and strength endurance of the arms and the performance of the straight punch for young players, Al-Hussein Specialized Forum. The researchers assumed that there is a positive effect of these exercises in developing the strength characterized by speed and strength endurance of the arms and the performance of the straight punch for young players.

The researchers used the experimental method in line with the nature of the problem. The research population was identified, namely the young boxing players at the training center of the Al-Hussein Specialist Forum in Najaf. They numbered (٢٠) players. The sample was chosen intentionally and numbered (١٦) and was divided into two groups (experimental and control). With (٨) players for each group after conducting homogeneity and parity in the research variables, after which the training curriculum was applied, which lasted (٨) weeks from ٢/٥/٢٠١٨ until ٤/٥/٢٠١٨, after which the post-test was conducted and the researchers used statistical methods through the statistical bag. (SPSS).

The researchers concluded that plyometric exercises have a positive effect in developing the strength characterized by speed and power extension of the arms in the experimental research sample, as well as in developing the performance of the straight punch. The researchers recommended generalizing the curriculum for plyometric exercises on boxing players for the rest of the categories and sports that need the strength characteristic of speed (AR) and power extension. in performing her skills.

Research plan and procedures:**Research Methodology:**

The researchers used the experimental approach, using a one-group experimental design, following the pre- and post-measurements, as it suits the nature of this study and its objectives.

research community:

The total population for the study consists of all junior karate players at the Minya Sports Club who are registered with the Egyptian Karate Federation for the ٢٠٢٢/٢٠٢٣ season, whose ages range from ٥-٨ years, and they number (٢٥) juniors.

The research sample:

The research sample was chosen intentionally, from karate youth at the Minya Sports Club, whose ages ranged from ٥-٨ years. The sample included (٢٥) youth, (٥) youth on whom the exploratory study was conducted, and (٢٠) youth on whom the basic study was conducted.

The researchers made sure of the moderation of the distribution of the sample members in light of height, weight, chronological age, training age, and the physical and skill abilities under study, and the following tables show this.

Table (١)**Description of the study sample members (n) = ٢٥**

skewness	maximum	minimum	standard	Average	Variables
٠.٥٨	٨	٥	١.٠٨	٦.٩٨	Age (year)
٠.١٨	١٣٠.٠	١٢٤.٠	٠.١٩	١٢٧.٢٣	Length (cm)
٠.٦٨	٣٣.٠	٢٧.٠	٩.١٥	٣١.٠٧	Weight (kg)
٠.٦٣	٤	١	٠.٥١	١.٣٩	Training age

It is clear from Table (١) that all values of the skewness coefficients for the variables were between (٠.١٨) and (٠.٦٨), which indicates the homogeneity of the study sample members with variables of height, weight, and age before conducting the study, which gives a direct indication that the data is free from the defects of non-moderate distributions.

Data collection methods:

To collect data for the research, the researchers used the following:

- Legal rug.
- (٢) Sony video cameras and (٢) tripods.
- Camera frequency (١٢٠ frames per second) .
- A computer equipped with a motion analysis program and a visual display device.

- Self-powered source (camera charging batteries) .
- A device for measuring the overall height of the body (height) (restameter).

Research tools and devices:

- Self-powered electrical source (camera charging batteries.)
- A medical scale to measure weight, and a stop watch.
- Guiding markings and adhesive marks to determine the body's joint points.
- A computer with high specifications, consisting of a ١٠٠٠ GB hard disk, ٤ GB memory, P(٥) ٤٠٠٠.
- Video card (In/Out), brand (ATI), one gigabyte.
- Motion Analysis Program (ٴD* kwon).
- Measuring tape in meters (cloth) .
- stopwatch and whistle.
- Records to record data.

Motion Analysis Program: Motion Analysis Program (ٴD* kwon)

- The program's calibration unit: The calibration system was photographed in the center of the imaging field for each of the three cameras, which is a cube with dimensions of ٴm x ٴm x ٴm.

Data extraction procedures and results using the motor analysis program and the computer:

- Reviewing imaging operations.
- Check the movie within the Video Scanning program.
- Determine the specifications for the analysis process.

Tests used in the study:

After reviewing many scientific sources and references related to tests and measurement, the tests that achieve the objectives of the research were determined by measuring these variables, and whose validity in measurement was proven through what was stated in the sources and references of previous researchers, from which they were taken, and they are as follows:

- **Test of strength characterized by speed for the arms:** Forward support test (bend and extend the arms for ١٠ seconds.)
- **Strength endurance test for the arms:** forward lean until the effort is exhausted.
- **Speed test for the arms:** Perform the front straight punch for (١٠) seconds.
- **Agility test:** ٤ x ١٠ m rebound run. **Attachment No. (١)**

The survey study :

The researchers installed the two cameras to be used in the main photography experiment in order to identify the possibilities of photography, distance and heights to install the cameras in the performance of the emerging skill to produce a clear and accurate film of photography, so that researchers could control the variables in question. Five (٥) people were hired from the original community and outside the research sample. The training programme was then applied to them using ballistic exercises over five training modules. The purpose of the exploratory study was as follows:

To identify the appropriate training load components for their time, and to distribute the module parts.

- Identify the time and place to apply the training program using ballistic exercises.
- Ensure the validity and availability of the sports tools used in the study .

To identify obstacles and errors that can be encountered by researchers during the course of the application.

Believe: In order to verify the accuracy of the programme and the tests designed for study purposes, using the content validation method, researchers presented the tests to a number of experienced and specialized experts on karate sports, to determine their views on the programme and tests, their suitability for improving certain chemic variables and certain physical qualities of skill and karate sport in general, and **annex** (٢) lists the names of the karate masters. Researchers also took expert observations and made the proposed amendments, since they confirmed the true content of the tests in the sense that the tests measured what they had been developed for them.

Persistence: In order to verify the stability of the study tool, researchers applied it to a sample of ٥ karate-producers registered by the Egyptian karate Union in the ٢٠٢٢/٢٠٢٣ season, taken from the study community and excluded from entry into the study sample, in a test and re-entry method (Test-Rest), with a one-week difference between the first and the second applications, the consistency factor between the two applications has been calculated and table (٢) illustrates this.

KIMATE Variables:

After looking at a number of scientific sources and references relating to the contribution of KEM indicators to the performance of the front straight punch of KOMIT in karate, it is clear to us that the most significant of these ratios are according to the performance stages, such as:

First, during the pre-trial phase :

-The greatest contribution of KEMs to the effective performance of the front straight punch skill was the speed of the right ankle joint.

-At the moment of the "punch-proof" the wheel of the left knee, which was ٢٨% the most effective contribution of the cymatic variables to the player's body parts to the performance of the front straight punch skill (٢:١-٣٦).

II. During the main phase:

The most significant contribution of the cymatic variables to the player's body parts during this phase (the moment of punching) was the speed of the left ankle, which was ٢٨.٣%, the wheel of the left knee, which was ٢٨.٠%, and the right ankle distance, which was ٢٥.٦% .

At the moment of the "punch," the most contributing ratio of the KEMs of the player's body parts to the effectiveness of the performance of the front straight punch skill was the angle velocity of the left elbow at ٤٥.٢%, and the angle velocity of the right elbow at ٢٠.٣%. (٢ : ١-٣٦) .

Table (٢)**The constant test factor used in the search is n.(٥)**

Pearson association factor (restoration constant)	Kimate Variables		
٠.٨٨	The speed of the right ankle joint.	Pre-trial stage	Key phase
٠.٨٩	Left knee wheel		
٠.٨٨	Left ankle speed	The moment you're paid.	
٠.٨٧	Left knee wheel		
٠.٨٩	The outcome of the right ankle removal	Punching moment.	
٠.٨٨	The corner speed of the left elbow		
٠.٨٦	The corner speed of the right elbow		

Physical variables:

The fatty tests used: (the distinct force at speed - carry the strength of the arms - Arm speed – Smoothness) .

Table (٣)

I'll describe some physical variables. I'll search for bikinimetry

skewness	standard deviation	Average	Physical variables
٠.٨٧-	٠.٣٩٠	٦.١٤	the distinct force at speed
٠.٥٢-	١٠.٠٥	١٩.٨٨	carry the strength of the arms
٠.٠١-	٣.٢٩	١٣.٤٨	Arm speed
٠.٨٣-	٣.٣٠	٧.٦٤	Smoothness

Basic experience:

Tribal test: Researchers conducted the test on Saturday, ٢٨ January ٢٠١٢, at ١٠ a.m., inside the karate gym at the Mania gym, by stabilizing and locating ٢ cameras. The first cameras were placed vertically on the front level of the player's movement and ٣ m from the player's track during performance and at the height of ١.٢٠ m, and the second with the same specifications and column on the side level of the player.

Training program using ballistic exercises:

After the sample has been selected, the necessary approvals have been taken and the trainings to be carried out have been clarified, the training of young people has been initiated with the use of a six-track training module, with a rate of three modules per week for eight weeks, from Wednesday (١/٢/٢٠٢٣m to Wednesday (٢٩/٣/٢٠٢٢), with a total of ٢٤ modules attached, and the application has been made on Saturdays, Mondays and Wednesdays each week.

Regulation of the proposed training programme:

- **Programme duration:** ٨ weeks
- **Number of training modules per week:** ٣ times
- **Season Period:** Special Preparation
- **The time of the ballistic module:** (٩٠) minutes of non-skilled training of the frontal straight punch skill.
- **Total number of training modules:** ٢٤
The total time of the program is ٢١٦٠ minutes or ٣٦ hours of training.
- **Number of training groups per exercise:** ٤-٦
- **Repetitions per exercise:** ٧٠٪ for screws, ٦٠٪ for screws, ٥٠٪ for screws, ٥٠٪ for screws.
- **Breaks between groups** ٢-٣ minutes

Thus, the exercises used were selected for both warm-up and calm, which were installed throughout the course of the ballistic training

programme and distributed to the programme ' s eight modules and weeks. The maximum one-time increase was then measured for each of the exercises selected at each of the starters ' sample study groups to calculate the percentage of the selected intensity (% , ٦٠% , ٧٠% , ٧٠%), on the first day of the first weeks, third, and fifth weeks. The severity chain of the training module has been fixed so that the first group (first cycle) exercises are performed at a high rate of ٥٠% and repeat, the second group at a high rate of ٦٠% and the last group at a high rate of ٧٠% and their frequency. The training programme was presented using ballistic exercises to a number of experts before the training programme was implemented. Their views were followed by the deletion of some trainings and other addition. Annex ٣ shows the ballistic trainings used in the programme and how they were distributed over the eight weeks.

The scientific basis of the program: The researchers designed the program according to the following bases:

- That the proposed programme and its content achieve the goal for which it was designed.
- The content of the program should be appropriate for the age of time and training, as well as the physical and skill level of the research sample.
- To be flexible in application and able to adjust to achieve the objective of the program :
- Arranging, harmonizing and distributing key duties to the weeks and units of the program.
- Graduation in the intensity of the training load is easy to find and simple to the boat.
- Performing a warm - up exercise to avoid infection.
- Integration of arms and men's training to achieve full benefit.
- The variety of exercises is explosive.
- At the end of each major segment, give a skillful exercise to the straight-up front punch for seven minutes, with a maximum of ٢٠%.
- Selection of exercises similar to the skilled performance of the straight-front punch skill in terms of the motor track and the concentration of power on the muscles in the performance.
- Implementation of ballistic exercises at the beginning of the main part of the research module because it requires the rest of the nervous system.

- Conduct ballistic exercises on a rotating basis during the week so that there is a training day and a rest day among the ballistic units of the proposed programme.
- The effort is not exhausted. Repeaters are only ٣.٥ times in each group, even if the young person feels that he can continue.
- Number of groups ٤.٥ repeater groups and ٦ time performance exercise groups (٢٩).

The British University of Birmingham has shown that a rest period of ٥ minutes is better than ٢ minutes because it leads to the growth of muscle weakness.

Study variables:

:: Independent variable: ballistic exercises used in the study.

The following variable: Some kinematic variables.

Dimensional measurements:

Remote measurements were made after the training programme had been implemented in the same order and the requirements for tribal measurements had been met on Saturday ١/٤/٢٠٢٣.

Statistical treatment:

In the light of the research objectives and the scope, the researcher used the Case study methodology for the experimental research sample of the research problem. The researcher also used the statistical method for analysing the data:

- Meta-statistics
- Asperman's engagement factor
- Significance of differences (v) in order to calculate honesty and consistency and to codify the scientific transactions of the tests used in this study.

Presentation and discussion of results: First, the results of the first hypothesis, which stated that there was a statistically significant effect at the level of (a) ٠.٠٥ for the use of ballistic exercises for the development of certain kinematic variables (right ankle joint velocity, left knee wheel, left ankle velocity, left ankle velocity, left ankle velocity, left elbow velocity, right elbow velocity, right elbow velocity, right elbow velocity) for the karate creation of the sports club from the age (٥-٨ years) and for the sake of telemetry. In order to respond to this assumption, mathematical averages, standard deviations, and test (v) between the tribal and remote tests of the study group members on study tests were used.

Table (٤)
Calculating average, standard deviation and value
And the significance of the differences between the tribal and remote
measurements of KEMs.(٢٠)

Statistical significance	Value (T)	Dimensional measurement		Kidnapping		Kimate Variables	
		A	S-	A	S		
٠.٠٠٠	٣.٢٥	٠.٦٣	٧.٦٢	٤.٠١	٤.٣٧	The speed of the right ankle joint	Pre-trial stage
٠.٠١٦	١.٧٦	٠.٠٤	٤.١٨	٠.٩٣	٢.٤٢	Left knee wheel	
٠.٠٢٣	٢.٣٧	٠.٧٠	٣.٥٣	١.٥٥	١.١٦	Left ankle speed	The moment you're paid.
٠.٠٣٢	٣.٣١	٤.٧٨	١٢.٢٣	٠.٧٦	٨.٩٢	Left knee wheel	
٠.٠٠١	٠.٢١	٠.٠٣	-٠.٢١	٠.١٥	-٠.٤٢	The outcome of the right ankle removal	
٠.٠٠٤	٦.٠٢	٠.٥٩	٤٥.٣٦	١.٣٤	٣٩.٣٤	The corner speed of the left elbow	Punching moment.
٠.٠٣٨	٢.٩٨	٠.٦٧	٣٣.٥٩	١.١٥	٣٠.٦١	The corner speed of the right elbow	

Table value (v) at (a) ٠.٠٥ = ٢.١٧٩

We note from table ٥ that there are statistically significant differences at the level of significance (a ٠.٠٥) between the tribal and remote measurements of certain KIM variables (right ankle artery velocity, left knee wheel, left ankle velocity, right ankle output, left elbow velocity, left elbow velocity, left elbow velocity, right elbow velocity, right elbow velocity) for the karate establishment of the sports club at the age of ٥-٨ years (search sample) and for the sake of telemetry.

The speed of the right ankle joint on the horizontal vehicle at the beginning of the attack has improved, owing to the fact that, in order to perform the straight front punch skill, the right man is slipping forward, leading the body movement to the beginning of the attack. This confirms the need for speed as a critical element in the karate sport, especially the speed of the front foot movement as one of the most important parts of the player's body for the start of the attack when performing the front straight punch skill. The ballistic exercises have played a major role in their improvement, as the optimal use of muscles and parts of the kinetic chain used in the performance of skills is the basis for the success of the skill performance, and in the light of the fact that the human body is an integral unit with the muscular work of the skill required to perform another muscle function in order to stabilize other parts of the body so that the parts required to move

can be moved with force and speed and until the motion is carried with precision.

At the time of the "punching bounce," the left knee tyre, which stood at ٢٨%, was the most effective contribution of the cymmatic variables of the player's body parts to the performance of the forward straight punch, was significantly improved. The researchers attributed that change in the speed of the left knee, as it moved in the direction of skill performance and prepared the foot to take the right place to take the right angle to achieve the best euthanasia to achieve the maximum explosive force, which would have the greatest impact on the development of the final product of the mechanical skill objective of the successful and economical accuracy and speed of the punch, and would assist in a sequential and sequenced movement to achieve the goal of the forward straight punch.

This is consistent with Nahed Anwar Sabagh, Jamal Aladdin (١٩٩٩), that in the case of rapid and powerful movements of the lower end, the man ' s circulatory axis moves up near the thigh joint and then drops to the knee joint during the motorization of the knee, because the knee ' s strength is the largest due to the large femur mass. This is evident in the fact that the most significant contribution of the cymmatic variables to the body parts of the player at the moment "Push me punching was the speed of the left ankle, which was ٢٨.٣%), the wheel of the left knee, which was ٢٨.٠%), and the right ankle distance of the right ankle (٥%.٦), since this acceleration in the body parts is the result of a successful ful and sequenced movement to achieve the perfect performance of the front straight pile (٢٣:٥٧).

While during the "punching" moment, the most contributing ratio of the KEMs of the player's body parts was to the effectiveness of the front-hand punch skill, which improved with the right-hand facility angle speed, researchers point out that the contribution ratio of the angle to the left-hand facility is large and almost twice as high as the angle to the right-hand facility, while performance of the straight-hand punch skill is to the right-hand side. The researchers attribute that the success of the skill requires a kinetic rhythm that produces an appropriate reaction from a strong withdrawal of the left-hand arm that helps to optimize the speed of the contraction with the right-hand arm in order to achieve the law of reaction. Here, the role of the ballistic training programme is to improve its speed and the power of reaction.

This improvement is due to the fact that young people regularly apply the training programme using ballistic training with multiple and varied activities, as well as to the planning and design of the programme using the scientific method, which included a physical preparation segment, where training is one of the basic principles in the development of the physical capacities of the activity in question, as well as the development of the training process in an organized scientific framework.

Second, the results of the second hypothesis, which states that there is a statistically significant effect at the level of $\alpha = 0.05$ for the use of ballistic exercises on the improvement of certain special physical characteristics (the rapid strength of the arms, the strength of the arms, the speed of the arms, the agility of the arms) when the karate grows from 9 to 14 years of age at the Sports Menia Club. To answer this assumption, mathematical averages, standard deviations, and a test of (t) between the two pre- and post-test subjects of the Study Group for study tests are shown in table 5 below.

Table (5)

Calculating average, standard deviation and value of T.

Between the tribal and remote measurements of physical variables, (20)

Value (T)	The difference between averages	Dimensional measurement		Kidnapping		Physical variables
		A	S-	A	S	
٦.٧٢	١.٢٠	٠.٣٠	٨.٩٨	٠.٨٥	٥.٠٣	the distinct force at speed
٧.٣٩	٣٧.٥١	٦.٩٩	٢٣.٣٤	١.٩٣	١٧.٩٣	carry the strength of the arms
٣.٨٢	٥.٠٦	٢.٢٥	١٦.٧٤	١.٢٩	١٢.٦١	Arm speed
٥.٩٧	٦.٧٠	١.٩٤	١٠.١٣	٠.٧٩	٦.٧٨	Smoothness

Table (s) at $\alpha = 0.05$ is ٢,٢٢.

Table 5 shows that there are statistically significant differences at the moral level ($\alpha = 0.05$) between the averages of the tribal and far-reaching measurements of physical tests, which shows that special physical qualities (the rapid strength of the arms carries the strength of the arms - the speed of the arms - the agility of the arms) have improved, and that is due to the positive effect of the ballistic exercises, which have had a direct reflection on the chemical variables of the skilled performance of the forward straight punch skills, as will be seen in the following findings.

It is consistent with all that Muhammad Thabhar (٢٠٠٩), Tamer Aweys (٢٠٠٩) and Samir Saba (٢٠١٠) have pointed out that ballistic training is capacity training and is one of the most rapid ways to develop the explosive muscular contraction by its ejaculation nature through which the lack of speed resulting from traditional heavy training (١٠:٤٠)(١٢:١٠)(٢٥:٣٢) can be overcome.

He also agrees with Nadir Ismail (٢٠١٦) that the muscle strength of the arms and the legs play a major role in improving the digital level of throwdown (٢٦:٢٣).

"The availability of public and active fitness elements helps to develop and improve the physical, motor and physiological capabilities of the individual, which contributes to the fulfilment of the requirements of the training process and competition with minimal physical effort, with the ability to quickly return to normal (٢٤:٧٨).

The researchers thus agree with the results of the Ali Hassan Bhuhammad (٢٠١٧), Mustafa Hashem (٢٠٠٥) and Ashraf Mussi (٢٠١٠) studies, where they noted the importance of using ballistic exercises to develop the elements of physical fitness, since physical preparation and backward training programmes contribute to the development of physical abilities.

Researchers also believe that ballistic exercises have developed the muscle strength of arms, and that Lenny Wilkins Adams, (١٩٩٩) confirms that one of the factors influencing successful performance is ballistic exercises, that this type of exercise contributes very positively to the development of explosive and graceful power and that there is a strong relationship between both ballistic exercises on the one hand and exploding and grace on the other, and explosive force on the basis of karate sports.

In addition, ballistic exercises reduce the base time during the punch, as confirmed by the Mehdi Kazem (١٩٩٥) study, that ballistic exercises have positive results in terms of influencing muscle groups as a way to develop the muscle capacity required by the nature of the skill in the study (٢٠:٢٧).

Researchers attribute the evolution of the kinematic variables to the characteristics of ballistic training, which has had an effective impact on rubber, muscle strength and joints. In some ways, these exercises have been carried out in the full range of kinetic performances, both for young people during the same skillful performance, as well as some of the lengthy, flexible and movement exercises that have been infused with the proposed training programme. This has had a positive impact on the increase in the level of muscle strength of the players as well as the power of the surrounding ligaments and joints. This is consistent with what Qasim Hassan and Iqr Shakir pointed out (١٩٩٨) in that the ballistic exercises are

one of the types of exercises that contribute to the improvement of certain special physical abilities, the most important of which is the muscle force. (١٥-١٠ : ١٢)

In the view of researchers, ballistic exercises are aimed at producing the greatest power in the shortest possible time, and they contribute to increasing the push upwards resulting from the rapid expansion of the working muscles resulting from their training and their adaptation to reduce the time lag and lengthening in the performance of their skilled tasks. The training programme, using ballistic exercises, has improved muscle velocity in sterilisation and contraction as it improves the explosive strength of the muscles of the arms and the legs, reflecting positively on the kinematic variables under consideration.

Conclusions:

١. The proposed ballistic training programme has had a positive impact on the kinematic variables (right ankle artery velocity, left knee wheel, left ankle velocity, right ankle outcome, left elbow velocity, left elbow velocity, right elbow velocity, right elbow velocity) under consideration. The proposed ballistic training programme has had a positive impact on the development of the physical capacity under consideration.

٢. There is a correlation between the development of physical qualities and the level of performance of basic skills.

Recommendations:

١. The use of the ballistic training programme as part of the programmes for the preparation of elected women and national teams for young people by the Egyptian Confederation of Carate.

٢. Use ballistic exercises during training programmes to ensure the successful achievement of the objectives of the programme.

٣. To direct the agencies involved in the various clubs to use the ballistic training programme during the preparation of teams of young people.

٤. Conduct similar studies to determine the impact of ballistic exercises on certain kinetic variables at different age stages and at different sports.

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Summary of the research in Arabic

The effect of ballistic exercises on some kinematic variables and the development of special physical characteristics for the front straight punch skill for karate juniors

Karate is a self-defense sport that consists of different skills. It requires the player to move with speed, agility, and strength under correct kinematic conditions to achieve the goal of the skill. The current research aims to identify the effect of a ballistic training program on developing some kinematic variables and some physical characteristics of the front straight punch skill. For junior karate players aged ٥-٨ years.

The researchers used the experimental approach using a one-group experimental design, following pre- and post-measurement, as it was appropriate to the nature and objectives of this study. The research sample consisted of junior karate players at the Minya Sports Club, whose ages ranged from ٥-٨ years, and the sample included (٢٥) juniors, (٥) Juniors on whom the exploratory study was conducted, and (٢٠) juniors on whom the basic study was conducted. The researchers assumed the presence of a statistically significant effect at the level ($\alpha \leq ٠.٠٥$) of using ballistic training on improving some kinematic variables among junior karatekas aged ٥-٨. Years at the Minya Sports Club, as well as the presence of a statistically significant effect at the level ($\alpha \leq ٠.٠٥$) of using ballistic exercises to improve some special physical characteristics (strength characterized by speed in the arms - strength endurance in the arms - speed of the arms - agility) among junior karatekas aged from ٥ -٨ years at Minya Sports Club.

The researchers concluded that the ballistic training program has a positive impact on some kinematic variables and some physical characteristics related to the front straight punch skill.

ملخص البحث باللغة العربية

تأثير تمرينات بالستية على بعض المتغيرات الكينماتيكية وتطوير صفات بدنية خاصة لمهارة اللكمة المستقيمة الأمامية لناشئ الكاراتية

رياضة الكاراتية من رياضات الدفاع عن النفس وهي التي تتكون مهارات مختلفة، وتتطلب من اللاعب التحرك بسرعة ورشاقة وقوة بشروط كينماتيكية صحيحة لتحقيق الهدف من المهارة، ويهدف البحث الحالي إلى التعرف على تأثير برنامج تدريبي بالستي على تطوير بعض المتغيرات الكينماتيكية وبعض الصفات البدنية لمهارة اللكمة المستقيمة الأمامية لناشئ الكاراتية من سن ٥-٨ سنوات.

إستخدم الباحثون المنهج التجريبي بإستخدام التصميم التجريبي ذى المجموعة الواحدة بإتباع القياس القبلى والبعدى، وذلك لمناسبته لطبيعة هذه الدراسة وأهدافها، وقد تكونت عينة البحث من ناشئ الكاراتية بنادى المنيا الرياضى والتي تتراوح أعمارهم من ٥-٨ سنوات، واشتملت العينة على (٢٥) ناشئ، (٥) ناشئين أجريت عليهم الدراسة الإستطلاعية، و(٢٠) ناشئ أجريت عليهم الدراسة الأساسية، وافترض الباحثون وجود تأثير ذو دلالة إحصائية عند مستوى $(a \geq 0.05)$ لإستخدام التدريبات بالستية على تحسين بعض المتغيرات الكينماتيكية لدى ناشئ الكاراتية الذين تتراوح أعمارهم من ٥-٨ سنوات بنادى المنيا الرياضى، وكذلك وجود تأثير ذو دلالة إحصائية عند مستوى $(a \geq 0.05)$ لإستخدام التدريبات بالستية على تحسين بعض الصفات البدنية الخاصة (القوة المميزة بالسرعة للذراعين - تحمل القوة للذراعين - سرعة الذراعين - الرشاقة) لدى ناشئ الكاراتية الذين تتراوح أعمارهم من ٥-٨ سنوات بنادى المنيا الرياضى .

واستنتج الباحثون أن للبرنامج التدريبي بالستي تأثيراً إيجابياً على بعض المتغيرات الكينماتيكية وبعض الصفات البدنية الخاصة بمهارة اللكمة المستقيمة الأمامية .