MODERN TECHNOLOGIES USED IN TEAM AND INDIVIDUAL SPORTS FOR DATA MEASUREMENT AND QUANTIFICATION

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Abstract: *Plyometric exercises represent a typology of aerobic exercises that are used to improve speed, physical resistance and strength. Monitoring strength training and reaction speed has a number of unique difficulties due to differences in physical characteristics and capabilities between athletes and the environment in which they perform. Thanks to this, the analysis, reliability and accuracy of the data provided by new smart technologies based and controlled in the easiest way through smartphones or tablets, can provide us with exact values of the executions.*

Key Words: plyometrics, technology, analysis, strength.

INTRODUCTION

The Beast Seansor device helps us to interpret the data and the load from strength training much more correctly and offers us results in real time. This device reports in detail the velocity of the barbell movement on the vertical axis to obtain target velocity ranges for different training objectives. eg: speed, maximal strength, power, hypertrophy (Shaw, Shaw, & Brown, 2015). Depending on these objectives, the speed of the dumbbell movement can be divided as follows:

Hypertrophy: Use to multiply muscle, gain strength and size with functional hypertrophy. The suggested speed range for this goal is between 0.4 and 1 m/s, and the repetitions performed should be between 5 and 15.

Maximal Strength: To increase the maximum force the muscles can produce in a single voluntary effort. The suggested speed range for this is between 0.1 and 0.5 m/s and the repetitions performed should be less than 5.

Power: This mod will determine the best conditions for power and speed to maximize peak power output (Hooper et al., 2014; Sánchez-Medina & González-Badillo, 2011). The suggested speed range for this is between 0.7 and 1.4 m/s and the repetitions performed should be between 3 and 8.

Speed: Use this mode to increase the maximum speed of your movements. The suggested speed range for this is greater than 1.3 m/s and the repetitions performed should be between 3 and 8. There are three important variables that are essential for muscle growth. These are: volume, intensity and density. The right combination of these three variables will increase the effectiveness of training, thus ensuring optimal muscle growth: Volume is basically the amount of work done.

It's usually calculated by multiplying reps, sets and weight, but the Beast sensor will do all the math and provide real-time analysis via the mobile app.

The biographical sources that led to this research are at the forefront of the field of sports science research, having as context the latest news about the future research within the supported theme. Among them are notable articles such as "Neuro-musculoskeletal and performance adaptations to lower-extremity plyometric training" (2010) written by G Markovic, P Mikulic which carefully analyzes the neuro-muscular part of the subjects in accordance with plyometric training, offering detailed attention to the link between the central nervous system and the development of reactive force influenced by plyometric exercises.

At the same time. Likewise, the article "Effects of Plyometric and Weight Training on Muscle-Tendon Complex and Jump Performance" K Kubo, Morimoto M, Komuro T and colleagues (2007)" studies the amplitude and effects of plyometrics in direct relation to an additional weight and outlines an idea quite clear about the effectiveness of resistance training for performance jumpers. Also "Periodization of sports training" (prof. univ. dr. Tudor O. Bompa, Michael C. Carrera), shed light on the methodology of application of strength training in the resistance regime, providing an important pillar in the knowledge of strength periodization according to the ergo genesis of the sport involved.

Research objectives:

1. Systematization of a database of subjects for the preparation of research training: Collection of personal, physical, biological data to establish the differences between them at the initial point of starting the research

2. Analysis of the biological and metabolic factors that suppress or favor the combined and isolated effects of plyometrics: Using research devices to demonstrate the veracity of the training themes produced

3. Periodization of training according to the training plan to obtain the expected results: Using the annual training plan to establish clear principles of strength training

4. Comparison of factors that can lead to an accelerated development of strength in resistance mode: Correlation of external and internal factors of strength training in order to obtain the main power-strength factor

5. Identification of the environment and the surface suitable for the development of plyometric training: Any external factor can lead to the improvement of the performance of plyometric training and we will try to obtain a suitable environment and a surface that will allow the training to take place.

Basic research:

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Description of the elements to be analyzed

1. Fitness accessories. Various accessories such as weights, dumbbells, elastic, plyometric crates will be used directly by the subjects

2. Physiological, biological and biomechanical measurements. Measurements will be made to determine the force of impact with the ground, the time spent on the ground, the speed of movement of the Olympic bars and the strength machines involved in the project.

3. Athletes: Performance athletes will be researched, especially those specialized in the 400m sprint and 400m hurdles and those specialized in the jumping events

4.. Historical and Reference Data: The research will include historical aspects and also reference data about the use of plyometric methods and strength development in resistance mode.

5. Analyzing and sorting statistical data: The collected information will be transformed into statistical analyzes to determine the quality of the research application.

6. Previous relevant studies: Within the elements that will be analyzed, relevant previous studies will be checked and analyzed, like those mentioned above, in order to compare and support the findings of the current research.

7. Current equipment. Using new devices in the field to determine the most relevant results.

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