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# Evaluation of the Jumping Training Program for the Development of Explosive Force in Handball Players

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**Abstract**: The confrontations of representative teams in international competitions bring to the attention of specialists the complex approach represented by physical training and especially explosive strength in the case of a handball team. The aim of the paper is to find out which are the advantages and disadvantages resulting from the application of a certain type of muscle training to handball players. During the study we found that this concept of muscle training for explosive strength is not fully understood by coaches. This article is based on a survey conducted in February 2021 using a questionnaire. The research subjects were represented by 43 performance athletes, registered as handball players, from 3 sports clubs in Romania. The group of teams that were part of the research is composed of CSS Medgidia, HCD Constanta, CS Medgidia. The research results showed that jumping on soft surfaces (sand, mats) used in training to develop explosive lower limb strength is sometimes included for 27.29% of the subjects and more often included for 0%, answering only one question.
We propose the urgent introduction of explosive strength training programs for handball players in the training program as a mandatory requirement for achieving desired results in future matches. Results have shown that these programs are not used in training so much as to have a significant influence. Clearly, coaches do not consider improving explosive strength a priority, influencing the players' vision, which does not include strategies for solving court tasks using technical elements that require explosive strength.

**Keywords:** *observation, efficiency, customization.*

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## 1. Introduction

The complex approach that physical training, especially explosive strength training, represents for a handball team needs to be approached professionally by customising the training programme for each individual athlete. Throughout the study, we found that this concept of muscle training in explosive strength is not fully understood, questionnaire response forms showed that it does not appear in training programs to the extent that it can have a significant influence, including coaches do not consider it a priority to use these program packages dedicated to improving explosive strength. Other studies and research described in various sources in the sports literature (David, 1960; Hedrick & Anderson, 1996; Henry & Whitley, 1960; Hoff & Almasbakk, 1995; Strass & Haberer, 1987) have shown that training through maximal strength exercises leads to improved explosive strength values and thus improved sports performance. Correlated with the reduced presence of explosive force training is the players perception of future confrontations, the forms of response to these demands in sporting competitions do not include strategies for solving tasks on the field using technical elements that require explosive force in particular.

## 2. Research objectives.

The main objective of the research was to determine the proportion and form in which jumps are included in lessons for strength development in general and explosive strength in particular in handball players.

## 3. Hypothesis

This tool was designed to test the confirmation or refutation of the hypothesis - "We consider jump weight training not a priority for explosive strength development". In the present study, we proposed a series of staged tasks, addressed in stages throughout the research.

## 4. Methodology

The research methods and tools used were represented by the dynamic documentation, the characteristics of this discipline and the topic put to research. The use of this method required the study and selection of the clearest and scientifically argued works in which this topic was treated. In the field of physical education, observation as a research method represents the multilateral study of a particular aspect of the instructional-educational

process. On the basis of our observation data, we made, by recording information, centralizing tables for the 11 items of our research instrument, thus each item having different answer variants, subjects being asked to opt for at least one answer variant or to choose a value on a proposed scale. The survey is part of complex research methods in physical education and sport. We used this method in particular in order to find out the opinions of the handball players who wanted to participate in our research. At this stage we developed the research design and the work steps, established the sample of subjects and research locations and developed the questionnaire. The group of subjects was constituted, and we centralized and processed the data. Interpretation of the results and highlighting the conclusions and processing of the information generated conclusions and proposals. This paper is based on a survey conducted in February 2021. Our research instrument (questionnaire) was presented to the subjects, its role in this study was explained and various recommendations were offered. Completion of the questionnaire was spontaneous where possible, when the teacher involved in our research responded to the questionnaire immediately. The research subjects were represented by 43 performance athletes, registered as handball players in 3 sports clubs in Romania. The group of teams that were part of the research is composed of: CSS Medgidia, HCD Constanta, CS Medgidia.

## 5. Research results

In order to be able to analyse and interpret the results, we present in the statistical analysis the 11 items of our questionnaire-based survey. Thus, following the processing of the options expressed by the subjects to question no.1 - Select the option that represents the most used exercises in physical training in the pre-competition period, we determined the percentage weight for each of the answer variants: variant A, running exercises for different distances or durations (endurance) 27.9%, variant B, running exercises for short and medium distances 6.97%, variant C, exercises performed in the gym 20. 93%, Variant D, jumping exercises (variants: free, over/over/over different obstacles) 16.3%, Variant E, circuit exercises (combinations of different exercises with or without objects, aimed at general strength or endurance, 27.9%. As we anticipate, strength training has remained largely in a traditional area, coaches for various reasons, some objective, largely use running and weight training.

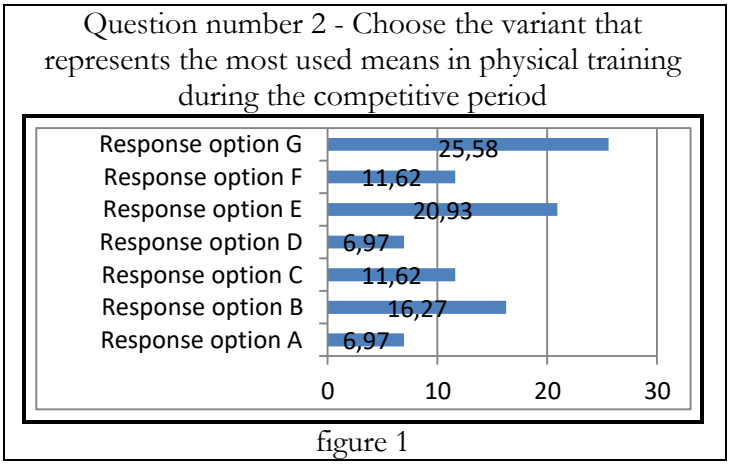



figure 1

Following the processing of the options expressed by the subjects to question no. 2 - Choose the option that represents the most used means of physical training during the competition period - here we have determined the percentage weight for each of the answer options, which we present below: Variant A, long-distance running exercises (endurance) over different distances or time durations 6.97%, Variant B, short and medium-distance running exercises (speed) 16.27%, Variant C, exercises performed in the gym 11.62%, Variant D, jumping exercises (variants: free, over/over/over different obstacles) 6. 97%, Variant E, coordination exercises (games with or without ball) 20.93%, Variant F, different exercises with or without objects, aimed at general strength or resistance) 11.62%, Variant G, handball game with different themes 25.58% . The low percentage is justified because the question refers to the modalities coaches use during the competition period (Figure 2). After processing the options expressed by the subjects to question no. 3. - What are the most used jumps in training for preparing? - we determined the percentage weight for each of the answer options as follows: long jump from place 0%, jumping with detachment on two legs in place 0%, detached jumps on two legs with movement 18,6%, step jumped 32.55%, step not jumped 34.88%, jump combinations 0%, jumping over obstacles 13.95%, 0% obstacle jumping. This means of muscle training through which coaches can make a significant contribution to technical and therefore tactical development has never been used. Processing the number of options expressed by subjects to question no. 4 - In the explosive strength development training programme, which jumps were most used? The response options were: long jump on the spot 0%, two-legged detached jumps on the spot 20.93%, two-legged detached jumps, step jumps 30.23%,

step jumps 32.55%, compound jumps 0%, jumps over hurdles 16.27%, jumps over hurdles 0% This continues to prove the use of a small

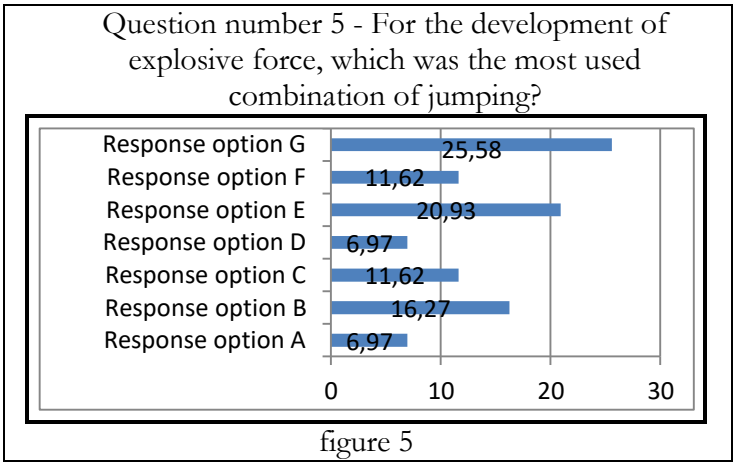



figure 5

number of means for explosive force training, most coaches prefer to use the other means. Question no. 5 - For the development of the explosive force, which was the most used combination of jumps? the percentages calculated by the statistical-mathematical method, for each of the three answer variants are: Application rate 0%, Relays 23.25%, structure of combinations of exercises with weights 76.74%, Structure of jump combinations 0%. For question no. 6 - In training, how often were jumps on soft surfaces used? the four answer options are the following: Variant A, very often 0%, Variant B, from 0%, Variant C, rarely 27.29%, Variant D, very rarely 72.09%. For question no. 7 - What exercises were included for the development of the general force? - we present the centralized data and the related percentages for each answer variant as follows: exercises performed in the gym 81,39, with objects and apparatus 11,62%, free exercises performed in the gym 0%, exercises with own body weight 6.97% jumping exercises (different types, with or without additional weights) 0%. Here is the centralization of responses and statistically determined percentages for question no. 8 - Of the jumps with two-legged detachments, please specify which jumps were most often used to develop explosive force? : two-legged detached jump - executed with rope, 0%, two-legged detached jump - "like a ball" 25.6%, two-legged detached jump - "like a ball" with additional weights attached 0%, sequences of related long jumps on the spot 34.88%, jumps over obstacles 39.53%. For the question no. 9 - What exercises were included to develop general strength - we present the centralised data and the corresponding percentages for each response option

as follows: Exercises performed in the strength room 81.39, with objects and apparatus 11.62%, free exercise in the gym 0%, exercises with own body weight 6.97%, jumping exercises (various types, with or without additional weights) 0%. The centralised data and statistically determined percentages for question no. 10 - Of the jumps with two-legged jumps, specify which jumps were most often used for developing explosive strength - were represented as follows: two-legged jump - performed with 0% rope, two-legged jump - "ball-like" 25.6%, two-legged jump - "like a ball", with additional weights attached, sequences of long jumps from a tied position 34.88%, jumps over hurdles 39,53%. For the last item of our questionnaire question no. 11 - On a scale of 1 to 9 (1 less important, 9 very important), please specify what role the different types of jumps would play in the development of explosive strength in handball players? 1 - 3 - 6 - 9. - we have centralised and presented the data in table 15. Out of the four answer options, we determined percentage weights for only three, as no subject opted for level one on the scale. The results were: 1 - Zero percent. 3 - The statistically determined percentage for level "3" is 18.6%. 6 - 46.51% opted for level "6" on the proposed scale, 9 - Maximum value, level "9" indicates that for 34.88% of the subjects surveyed, handball players, the role of jumping in the development of explosive strength is very important, but a degree of awareness of the importance of these skills and therefore a higher proportion of jumping in various forms in the content of training.

## 6. Conclusions

The research showed that jumping on soft surfaces (sand, mats) as part of training lessons to develop lower limb explosive strength is rarely included for 27.29% of subjects and very rarely included for 72.09%, this result being only one of thirty sets of responses chosen by subjects. The result of the questionnaire proves that the use of training programs is not correlated with the demanding situations in the field. According to the results of the research, it was found that there is a positive dynamic of changes in the formation of attitudes characteristic of the high-level handball player, but it should be strengthened by increasing the weight of muscle training programs and explosive strength in particular. The need to work and introduce explosive strength for handball players into the training plan at the right times is part of the complex process of achieving the desired results in future matches. After the analysis and processing of the data for this paper, we came to the following conclusions: the hypothesis that "We consider that the weight of jumping in training is not a priority for the development of

explosive strength" was confirmed. In relation to the type of strength pursued as a training objective, we found that the share of the use of jumps is different, with a significant increase in their use in the parts of the lesson aimed at speed/explosive strength; rarely 27.29%, very rarely 72.09%.

## References

David, H. C. (1960). Correlation between the Strength/Mass Ratio and the Speed of an Arm Movement, Research Quarterly. *American Association for Health, Physical Education and Recreation*, *31*(4), 570-574. https://doi.org/10.1080/10671188.1960.10613110

Hedrick, A., & Anderson, J. C. (1996). The Vertical Jump: A Review of the Literature and a Team Case Study. *Strength and Conditioning Journal, 18*(1), 7-12. https://doi.org/10.1519/1073-6840%281996%29018%3C0007%3ATVJARO%3E2.3.CO%3B2

Henry, F. M., & Whitley, J. D. (1960). Relationships between Individual Differences in Strength, Speed, and Mass in an Arm Movement. *Research Quarterly*, *31*(1), 24-33. https://doi.org/10.1080/10671188.1960.10613073

Hoff, J., & Almasbakk, B. (1995). The effects of maximum strength training on throwing velocity and muscle strength in female team-handball players. *Journal of Strength and Conditioning Research*, *9*(4), 255-258. https://doi.org/10.1519/1533-4287%281995%29009%3C0255%3ATEOMST%3E2.3.CO%3B2

Strass, D., & Haberer, K. (1987). Der Einfluß von Maximalkrafttraining auf die Sprintleistung des Wettkampfschwimmers [The influence of maximal strength training on the sprint performance of competitive swimmers]. *Leistungssport, 17*(4), 49-53. https://www.iat.uni-leipzig.de/datenbanken/iks/ls/Record/2001610