

ANALYSIS OF SEVERAL MORPHOLOGICAL, BASIC AND MOTILE DIMENSIONS AT FREE-STYLE WRESTLERS, BETWEEN INITIAL AND FINAL MEASUREMENT

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Summary

In the process of analysis of all specific tests referring to wrestlers, the following can be drawn: in the results analysis referring to basic motor abilities, it can be concluded that the wrestlers in the category of 60, 66 and 74 kg appear to be superior. The tested wrestlers show significant difference in weight categories in the variables of sport results. The best results were acquired by the wrestlers in the following categories: 55, 60 and 74 kg. If we analyse morphological characteristics of the tested wrestlers, it is clear that longer arms and larger body circumference (only muscles tissue), give a successful contribution in performing the mentioned tests. It is necessary to point out that the wrestlers with low body weight were more successful in performing the tests that did not include throwing wrestling doll, in other words, the tests which included performing wrestling bridge, that is, activities on floor. Coordination, endurance of arms and shoulders, speed of alternate movements and flexibility have an important influence on performing the tests being specific for wrestlers. It is sure that all the questions related to the sport of wrestling were not answered in this research, but the author hopes that the given answers can serve as the answers to some important questions on how to organize and direct the training process with a wrestler.

Key words: *wrestlers, effects, abilities*

Introduction

Wrestling is a part of the group for poly-structural acyclic sports which is dominated by acyclic movements, and where the results, in most of cases, are represented by binary variable (wins-loses), where movement is performed and limited in the direct confrontation with the opponent and where the aim of movement is symbolic destruction of your opponent. Wrestling is a part of group of sports having the largest complexity. It is characterized by diversity and a plenty of technical elements, tactics, movements of a whole body and extremities in different directions with unsteady intensity and unsteady tempo. All the mentioned movements are performed in hundreds of different situations and for that reason they can be called situational, unsteretyped and acyclic. Modern training today has, firstly, as its basic aim efficacy of work during training, reducing the volume of training and finding optimal intensity of burden. Modern wrestling requires that a wrestling fight takes its course relatively short time and in a fast tempo and that it contains a lot of technique - tactical activities. The top level wrestlers have to be versatile and their repertoire must obligatory include a few grips "special ones" from different technique groups, of different tactics for each of the grasps as well as for the fight with different opponents. This kind of complex activity of a wrestler during a fight requires adequate abilities, in other words, the appropriate dimensions of anthropologic status.

Problem and Aim

Subjects to this research are the following segments of wrestler's anthropologic status: Morphological characteristics, motor abilities, wrestler's specific motor abilities. Basic **objective** of this investigation is fortification on wrestler's anthropologic characteristics structure, the level of their transforming changes and the effect of the same in the success of specific motor duties execution in wrestling. **Special objectives are:** To define variables and proceedings on the basis of which is possible to execute as better the success forecast on wrestling as possible and to fortify the effect of anthropologic status dimensions on the expression of motor and specific motor abilities in wrestling (initial and final measure). The **Examinee samples, in this research, have** consisted of the wrestlers from the following wrestling clubs of Republic of Macedonia. Wrestling club "SHARR" Tetovo and Wrestling club "TEFEJUS" Skopje. Total number of those that have constituted this examinee sample is 65 wrestlers, the category from 55 kg to 103 kg, age average is 23,13 and the average of wrestling experience year is 5,92, all competing in the first league of the R. Macedonia.

Methods

Assuming the results of past research, subjects, problems and aims of this research, the following theoretical hypothesis can be pointed out: 1) no statistically important partial quantity changes between initial and final measurement are expected in

the scope of morphology characteristics, 2) some statistically partial quantity changes between initial and final measurement are expected in the scope of motor abilities, 3) some statistically partial quantity differences between initial and final measurement are expected in the scope of specific motor abilities. Estimation of morphological characteristics was performed based on the following anthropometrical variables: 1) for estimation of longitudinal (length) dimension of skeleton: body height - AVIST, legs length - ADUŽNO, arms length - ADUŽRU, 2) for estimation of transversal (diagonal) dimension: pelvis width - AŠIRKA, wrist width - ADIRZG, knee width - ADIKOL, 3) for estimation of volume and mass: body mass - ATLMAS, average chest volume measurement - AOBGRU, forearm volume - AOBPOD, 4) for estimation of under skin fat tissue: back skin fold - ANABLE, stomach skin fold - ANABTR, upper-arm skin fold - ANABNA. Motor abilities were estimated by the following variables: 1) for estimation of explosive strength: standing long jump - MFESDEM, standing jump up - MFESVM, throwing medicinal ball in roundabout way - MFEUVN, 2) for estimation of coordination: agility in air - MKTOUZ, drumming with arms and legs - MKTBNR, figure eight with bowing - MAGOSS, 3) for estimation of speed in alternative movements; arm tapping - MBFTAR, legs tapping - MBFTAN, 4) for estimation of flexibility: low touch-toe - MFLPRK, wrestling bridge - MFLRMO, 5) for estimation of repetitive strength : lifting body in guard position - MRCDTZ, bench press - MRABPT, pull-up hang - MRAZGP, 6) for estimation of balance: standing alongside on one leg with open eyes - MBAV10, standing diagonally on one leg with closed eyes - MBAU20. The variables for estimation of specific motor abilities are the following: salto forward in return - KONAUZ, a bridge and returning to standing position - MOVORUS, performing a pirouette from a bridge - PIORMO, coordination without a doll - KOBELU, coordination with and without a doll - KSABEL, throwing a doll right - KOSALD, throwing a doll left - KOSALL, 15 doll throws - BACLUT. The analysis of partial quantity

changes (T-test) was applied for the purpose of data processing, For the purpose of determination of partial quantity differences (partial quantity effects of changes), especially for the changes in all the applied tests for estimation of morphological, motor and specific-motor variables, we had application of univariant level of testing (T-test for dependent samples).

Results

On the basis of the results of arithmetic means in morphological variables at initial and final measurement (Table 1.), and on the basis of the importance of changes (differences) tested by T-test for dependent samples, it is clearly seen that training program did not produce statistically important partial quantity effects. This completely proved the **hypothesis 1**, which says: **it is not** expected to find some statistically important partial quantity changes between initial and final measurement in the scope of morphological characteristics. In the T-test motor variables results (table 2), some statistically important differences between the initial and final measurement were found in the following variables: the standing broad jump (MFESDM), standing jump up (MFESVM), throwing medicinal ball with bend (MFEUVN), drumming with legs and arms (MKTBNR), figure eights with bowing (MAGOSS) and standing diagonally at one leg with closed eyes (MBAU20). This partially proved **hypothesis 2**, which says as it follows: **it is expected to find statistically important partial quantity changes between initial and final measurement in the scope of motor abilities**. In the results of T-test of specific motor abilities (table 3.), some statistically important differences between initial and final measurement were realized in all the applied variables, except in the variable of sault forward and backward (KONAUZ). This completely proved the hypothesis 3, which says the following: **some statisticly important partial quantity differences between initial and final measurement is expected in the scope of motor abilities**.

Table 1. T-test – morphology characteristics: Paired Differences, 95% Confidence interval. Df=107.

| | Mean | Std.Dev. | Std.Err. | Difference | | t | Sig. |
|----------------|------|----------|----------|------------|-------|-------|------|
| | | | | Mean | Lower | | |
| Pair 1 AVISTJ | 0.01 | 0.13 | 0.01 | 0.04 | 0.01 | -0.95 | 0.34 |
| Pair 2 ADUŽNO | 0.02 | 0.31 | 0.03 | 0.04 | 0.08 | 0.59 | 0.56 |
| Pair 3 ADUŽRU | 0.04 | 0.49 | 0.05 | 0.13 | 0.06 | -0.76 | 0.45 |
| Pair 4 AŠIRKA | 0.00 | 0.08 | 0.01 | 0.02 | 0.02 | 0.11 | 0.91 |
| Pair 5 ADIRZG | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | -0.33 | 0.74 |
| Pair 6 ADIKOL | 0.01 | 0.05 | 0.01 | 0.02 | 0.00 | -1.05 | 0.30 |
| Pair 7 ATLMAS | 0.16 | 1.17 | 0.11 | 0.38 | 0.62 | -1.43 | 0.16 |
| Pair 8 AOBGRU | 0.01 | 0.70 | 0.07 | 0.13 | 0.14 | 0.14 | 0.89 |
| Pair 9 AOBPOD | 0.02 | 0.15 | 0.01 | 0.44 | 0.01 | -1.12 | 0.27 |
| Pair 10 ANABLE | 0.00 | 0.03 | 0.00 | 0.01 | 0.01 | 0.07 | 0.95 |
| Pair 11 ANABTR | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | -1.10 | 0.27 |
| Pair 12 ANABNA | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | -1.25 | 0.22 |

Table 2. T-test of motor ability Paired Differences, 95% Confidence interval. Df=107.

| | Mean | Std.Dev. | Std. Err. | Difference | | t | Sig. |
|----------------|-------|----------|-----------|------------|-------|--------|-------|
| | | | | Mean | Lower | | |
| Pair 1 MFESDM | -1.14 | 4.65 | 0.45 | -2.03 | -0.25 | -2.55 | 0.01 |
| Pair 2 MFESVM | -1.36 | 1.03 | 0.10 | -1.56 | -1.17 | -13.77 | 0.00 |
| Pair 3 MFEUVN | 34.18 | 79.74 | 7.67 | 49.39 | 18.96 | -4.45 | 0.00 |
| Pair 4 MKTOUZ | 0.72 | 2.53 | 0.24 | 0.23 | 1.20 | 2.95 | 0.00 |
| Pair 5 MKTBNR | 9.69 | 24.30 | 2.34 | 5.06 | 14.33 | 4.15 | 0.00 |
| Pair 6 MAGOSS | 0.13 | 0.30 | 0.03 | 0.08 | 0.19 | 4.71 | 0.00 |
| Pair 7 MBFTAR | -0.04 | 0.87 | 0.08 | -0.20 | 0.13 | -0.44 | 0.66 |
| Pair 8 MBFTAN | 0.00 | 0.14 | 0.01 | -0.03 | 0.03 | 0.00 | 1.00 |
| Pair 9 MFLPRK | -0.11 | 1.19 | 0.11 | -0.34 | 0.12 | -0.97 | 0.34 |
| Pair 10 MFLRMO | -0.28 | 2.92 | 0.28 | -0.83 | 0.28 | -0.99 | -0.32 |
| Pair 11 MRCDTZ | -0.09 | 2.71 | 0.26 | -0.61 | 0.42 | -0.36 | 0.72 |
| Pair 12 MRABPT | -0.09 | 0.97 | 0.09 | -0.28 | 0.09 | -0.99 | 0.32 |
| Pair 13 MRAZGP | -0.05 | 3.92 | 0.38 | 0.80 | 0.70 | -0.14 | 0.89 |
| Pair 14 MBAV10 | -2.82 | 18.35 | 1.77 | -6.32 | 0.68 | -1.60 | 0.11 |
| Pair 15 MBAU20 | -4.43 | 22.33 | 2.15 | -8.68 | -0.17 | -2.06 | 0.04 |

Table 3. T-test-specific motor ability Paired Differences, 95% Confidence interval. Df=107.

| | Mean | Std.Dev. | Std. Err. | Difference | | t | Sig. |
|---------------|-------|----------|-----------|------------|-------|-------|------|
| | | | | Mean | Lower | | |
| Pair 1 KONAUZ | -0.37 | 3.60 | 0.35 | -1.06 | 0.32 | -1.07 | 0.29 |
| Pair 2 MOVRUS | -1.57 | 5.15 | 0.50 | -2.56 | -0.59 | -3.18 | 0.00 |
| Pair 3 PIORMO | -4.54 | 5.86 | 0.56 | -5.66 | -3.42 | -8.04 | 0.00 |
| Pair 4 KOBELU | 28.50 | 80.48 | 7.74 | 13.15 | 43.85 | 3.68 | 0.00 |
| Pair 5 KSABEL | 33.21 | 73.51 | 7.07 | 19.19 | 47.24 | 4.70 | 0.00 |
| Pair 6 KOSALD | 27.41 | 89.77 | 8.64 | 10.28 | 44.53 | 3.17 | 0.00 |
| Pair 7 KOSALL | 33.96 | 152.06 | 14.63 | 4.96 | 62.97 | 2.32 | 0.02 |
| Pair 8 BACLUT | 69.64 | 217.17 | 20.90 | 28.21 | 11.07 | 3.33 | 0.00 |

Discussion and conclusion

The basic aim of this research was to determine the structure of anthropological characteristics at wrestlers, the level of their transformation changes and their influence on success in performing specific motor tasks in wrestling. The research was realized with 65 testees – wrestlers from three first league clubs in the Republic of Macedonia during which the number of 12 variables of morphological characteristics were applied, together with 15 tests for motor abilities and 8 tests of specific motor abilities. This proved the main hypothesis which says: the applied process of training will partially influence the quality changes of some applied anthropological characteristics. For the purpose of determining partial quantity changes (partial quantity effects of a change) and especially for the changes in tests for estimation of the applied anthropological dimensions, the T-test for dependent samples was applied. The T-test results referring to the dependent samples at the beginning and end of the applied measurement program implied that the greatest number of variables suffered some significant partial quantity changes in comparison to their initial status.

All of this completely confirmed all particular hypothesis and the conclusion is as follows: 1) there are no statistically important partial quantity changes between initial and final measurement in the scope of morphological characteristics, 2) Statistically important partial quantity changes between initial and

final measurement appeared in the scope of motor abilities, and 3) Statistically important partial quantity differences between initial and final measurement appeared in the scope of specific motor abilities. In the process of analysis of all specific tests referring to wrestlers, the following can be drawn as conclusion: In the results analysis referring to basic motor abilities, it can be concluded that the wrestlers in the category of 60, 66 and 74 kg appear to be superior. The tested wrestlers show significant difference in weight categories in the variables of sport results. The best results were acquired by the wrestlers in the following categories: 55, 60 and 74 kg. If we analyse morphological characteristics of the tested wrestlers, it is clear that longer arms and larger body circumference (only muscles tissue), give a successful contribution in performing the mentioned tests. It is necessary to point out that the wrestlers with low body weight were more successful in performing the tests that did not include throwing wrestling doll, in other words, the tests which included performing wrestling bridge, that is, activities on floor. Coordination, endurance of arms and shoulders, speed of alternate movements and flexibility have an important influence on performing the tests being specific for wrestlers. It is sure that all the questions related to the sport of wrestling were not answered in this research, but the author hopes that the given answers can serve as the answers to some important questions on how to organize and direct the training process with a wrestler.

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ANALIZA NEKIH MORFOLOŠKIH, BAZIČNIH I MOTORIČKIH DIMENZIJA KOD HRVAČA SLOBODNIM STILOM, IZMEĐU INICIJALNOG I FINALNOG MJERENJA

Sažetak

In the process of analysis of all specific tests referring to wrestlers, the following can be drawn: in the results analysis referring to basic motor abilities, it can be concluded that the wrestlers in the category of 60, 66 and 74 kg appear to be superior. The tested wrestlers show significant difference in weight categories in the variables of sport results. The best results were acquired by the wrestlers in the following categories: 55, 60 and 74 kg. If we analyse morphological characteristics of the tested wrestlers, it is clear that longer arms and larger body circumference (only muscles tissue), give a successful contribution in performing the mentioned tests. It is necessary to point out that the wrestlers with low body weight were more successful in performing the tests that did not include throwing wrestling doll, in other words, the tests which included performing wrestling bridge, that is, activities on floor. Coordination, endurance of arms and shoulders, speed of alternate movements and flexibility have an important influence on performing the tests being specific for wrestlers. It is sure that all the questions related to the sport of wrestling were not answered in this research, but the author hopes that the given answers can serve as the answers to some important questions on how to organize and direct the training process with a wrestler.

Key words: hrvai, efekti, sposobnosti

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