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Original article

COMPARATIVE STUDY OF SOMATIC AND MOTOR CHARACTERISTICS OF THE FIRST 100 HAMMER THROW ATHLETES ALL TIME

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Abstract*

Aim. Study bibliography. The collection and tabulation of the following parameters: performances, age, height and weight on the first 100 hammer throw athletes seniors outdoors all time. Processing statistical and mathematical data specified above, regarding the following indicators: number of cases, maximum value, minimum value, amplitude, mode, median, average, quartile 1, 3, quartile difference, dispersion, average of absolute deviation, standard deviation, coefficient of variation and correlation. Evaluation of the results and their interpretation.

Methods. As a research method we have used the case study, observation, statistics and graphics.

Results. After data processing have resulted 2 summary tables and 4 graphs.

Conclusions. The average performances is 82.45 m for men and 72.68 m for women. The average age is 28.63 years for men and 26.54 years for women. The average height is 188.03 cm for men and 175.60 cm for women. The average weight is 112.09 kg for men and 84.81 kg for women

Keywords: athletes, hammer throw, high performance, statistics.

Introduction

The effort provided by the hammer throw, is a type of anaerobic alactacid. The small phosphocreatine (PC) deposit is that who supplies power for muscles for 7 to maximum 10 seconds. (Bompa, 2001)

As a general definition, we can say that the performance is "the result of human action superior to known results". (Țifrea, 2002) In evaluating athletes we must always take into account two fundamental components of human performance in general: the biological and psychological.

In this way the body composition corresponds to the structural components of the human body composed of elements of very different nature and density (bone, fat, water, protein), maintained in constant proportion and functionally integrated. (Cordun, 2011) In this way the precise knowledge of the athlete's height and weight and is welcome framing it in a test pattern.

Methods

In this study we envisaged test hammer throw athletes, that is performance level, age, height and weight of athletes. The study is transverse type, all measurements were taken with the date December 31.2016.

This paper presents the performance of the first 100 athletes outdoor all time and some of somatic data (where they could be found). On this basis it could extract stable elements and exceptions in performance and somatic data. Material interest mainly specialists in the field, and future graduates with deepening athletics.

As objectives we have proposed:

- Study bibliography.
- The collection and tabulation of the following parameters: performances (www.iaaf.org), age (www.sports-reference.com), height and weight (www.european-athletics.org) on the first 100 hammer throw athletes (www.en.wikipedia.org) seniors outdoors all time.
- Processing statistical and mathematical data specified above, regarding the following indicators: number of cases, maximum value, minimum value, amplitude, mode, median, average, quartile 1, 3, quartile difference, dispersion, average of absolute deviation, standard deviation, coefficient of variation and correlation. (Cărbunaru, 2009)
- Evaluation of the results and their interpretation.

As a research method we have used the case study, observation, statistics and graphics.

Results

In what follows, we present the 2 tables and 4 graphs representative research conducted.

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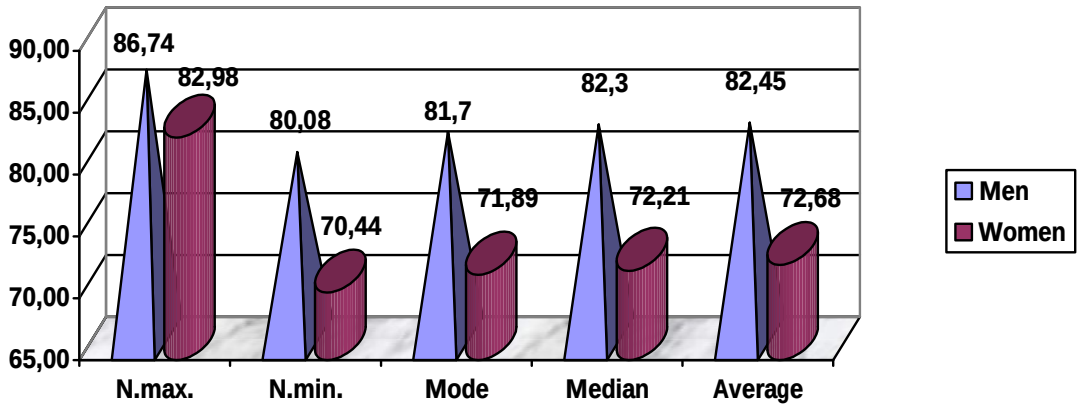
Table 1: Statistics indicators of the men hammer throw

Indicators	Performance (m)	Age (years)	Height (cm)	Weight (kg)
N	390	390	361	361
N. max.	86,74	41	197	130
N. min.	80,08	21	176	70
Amplitude	6,66	20	21	60
Mode	81,70	28	192	120
Median	82,30	28	188	113
Average	82,45	28,63	188,036	112,09
Quartile 1	81,82	26	185	106
Quartile 3	82,935	31	192	120
Quartile difference	1,115	5	7	14
Dispersion	1,30635	12,41171	18,39483	70,57059
Average of absolute deviation	0,83527	2,80239	3,57987	7,11004
Standard deviation	1,14296	3,52303	4,28892	8,40063
Coefficient of variation	1,38624	12,30393	2,28090	7,49445
Correlation*	0,10674	-0,14771	-0,072981	0,56969

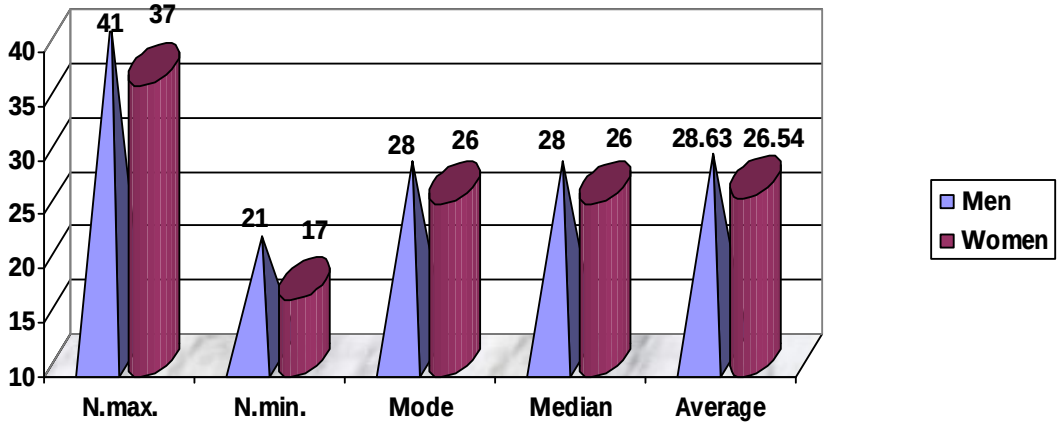
Table 2: Statistics indicators of the women hammer throw

Indicators	Performance (m)	Age (years)	Height (cm)	Weight (kg)
N	1980	1980	1894	1882
N. max.	82,98	37	193	118
N. min.	70,44	17	163	66
Amplitude	12,54	20	30	52
Mode	71,89	26	175	85
Median	72,215	26	175	83
Average	72,684	26,54	175,60	84,81
Quartile 1	71,28	24	173	78
Quartile 3	73,7325	29	180	90
Quartile difference	2,4525	5	7	12
Dispersion	3,35253	11,14196	26,18132	128,22106
Average of absolute deviation	1,44734	2,73717	4,01177	8,57852
Standard deviation	1,83099	3,33796	5,11677	11,32347
Coefficient of variation	2,51911	12,57498	2,91383	13,35136
Correlation*	0,14967	0,150454	0,0014607	0,48316

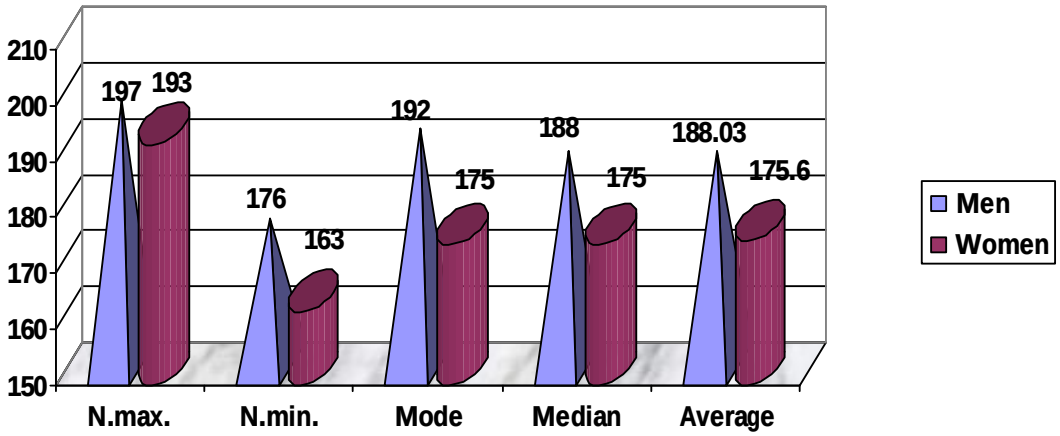
* - In order from left to right: correlation between performance and age, the correlation between performances and height, the correlation between performances and weight, the correlation between height and weight.



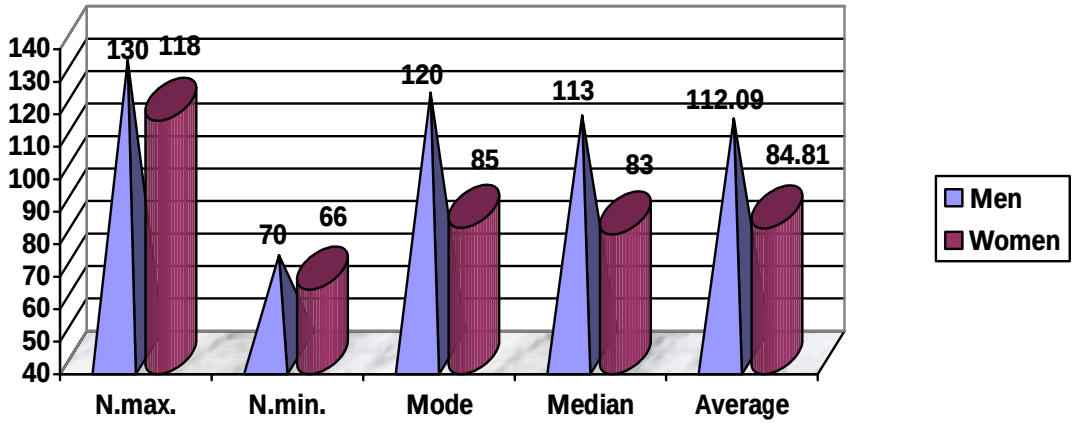
Graph 1 Statistics indicators of the hammer throw performances



Graph 2: Statistics indicators of the hammer throw age



Graph 3: Statistics indicators of the hammer throw height



Graph 4: Statistics indicators of the hammer throw weight

Discussions

Statistical indicators of results (tables 1, 2):

- Compared with the 1993 data the best men performance in our study is 1.94 m bigger. (A.N.E.F.S., 1993)
- The number of cases for women in the hammer throw (1980) is bigger than that of men (390) with 1590.
- The amplitude of results in the hammer throw for women (12.54 m) is greater than that of men (6.66 m) with 5.88 m.
- The mode of performances in the hammer throw to the women is 71.89 m and for men 81.70 m.
- The median of performances in the hammer throw to the women is 72.215 m and for men 82.30 m.
- The average of performances in the hammer throw to the women is 72.684 m and for men 82.45 m.
- The middle interval (half of cases) in the hammer throw for women is bigger than that of men, as follows: 2.4525 m between 71.28 m and 73.7325 m at the women and 1.115 m between 81.82 m and 82.935 m at the men.
- We have a very good homogeneity both women (2.51911%) and men (1.38624%).
- Is there a lack of correlation between results and other parameters investigated.

Statistical indicators of age (tables 1, 2):

- Compared with the 1993 data for best performance, age of men in our study is 1 year lower (31 years as compared to 32 years). (A.N.E.F.S., 1993)
- The number of cases for women in the hammer throw (1980) is bigger than that of men (390) with 1590.
- Maximum age in the hammer throw for women (37 years) is lower than that for men (41 years) with 4 years.
- Minimum age in the hammer throw for women (17 years) is lower than that for men (21 years) with 4 years.
- The amplitude of age in the hammer throw for women and men is 20 years.
- The mode of age in the hammer throw to the women (26 years) is lower than that for men (28 years) with 2 years.
- The median of age in the hammer throw to the women (26 years) is lower than that for men (28 years) with 2 years.
- The average of age in the hammer throw to the women (26 years) is lower than that for men (28.63 years) with 2.63 years.
- The middle interval (half of cases) in the hammer throw for women it is equal than that of men, 5 years, as follows: between 24 and 29 years at the women and between 26 and 31 years at the men.
- We have a medium homogeneity both women (12.57498%) and men (12.30393%).
- Is there a lack of correlation between age and other parameters investigated.

Statistical indicators of height (tables 1, 2):

- Compared with the 1993 data, for the best performance, height of men in our study is 5 cm bigger (185 cm compared to 180 cm). (A.N.E.F.S., 1993)
- The number of cases for women in the hammer throw (1894) is bigger than that of men (361) with 1533.
- The amplitude of height in the hammer throw for women (30 cm) is bigger than that for men (21 cm) with 9 cm.
- The mode of height in the hammer throw to the women is 175 cm and for men 192 cm.
- The median of height in the hammer throw to the women is 175 cm and for men 188 cm.
- The average of height in the hammer throw to the women is 175.60 cm and for men 188.036 cm.
- The middle interval (half of cases) in the hammer throw for women it is equal than that of men, 7 cm, as follows: between 173 cm and 180 cm at the women and between 185 and 192 cm at the men.
- We have a very good homogeneity both women (2.91%) and men (2.28%).
- Is there a lack of correlation between height and other parameters investigated.

Statistical indicators of weight (tables 1, 2):

- Compared with the 1993 data, for the best performance, the weight of men in our study is bigger with 1 kg (106 kg compared to 105 kg).
- The number of cases for women in the hammer throw (1882) is lower than that of men (361) with 1521.
- The amplitude of weight in the hammer throw for women (52 kg) is lower than that for men (60 kg) with 8 kg.
- The mode of weight in the hammer throw to the women is 85 kg and for men 120 kg.
- The median of weight in the hammer throw to the women is 83 kg and for men 113 kg.
- The average of weight in the hammer throw to the women is 84.81 kg and for men 112.09 kg.
- The middle interval (half of cases) in the hammer throw for women is lower than that of men, as follows: 12 kg between 78 kg and 90 kg at the women and 14 kg between 106 kg and 120 kg at the men.
- We have a good homogeneity at men (7.49%) and medium for women (13.35%).

Conclusions

- The average performances is 82.45 m for men and 72.68 m for women
- The average age is 28.63 years for men and 26.54 years for women
- The average height is 188.03 cm for men and 175.60 cm for women
- The average weight is 112.09 kg for men and 84.81 kg for women

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