The Correlation between Strength and Anthropometric Charecteristics in Arm Wrestling Athletes with Performance

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ABSTRACT

In this study the goal is to define the correlation of the competition performance and to define some of the anthropometrical properties of male arm wrestlers. In this study, athletes were chosen randomly and 53 male athletes who were voluntary and that attended the Turkish University Sports Federations Arm Wrestling Turkish Championship has participated. In the research scope, the dominant hand grip force and anthropometrical properties being height, weight, bicep circumference, humerus length, front arm circumference, front arm length, hand span length of the dominant hand and hand length parameters has been included. The SPSS 17 (SPSS Inc., Chicago, IL, USA) packet program was used in the analysis. When the correlation values were examined of the hand griping forces it was observed that all of the anthropometrical properties were in the positive direction and significant ($p < 0.001$) interactive, it has been observed that the competition performance including the hand gripping force that no parameter was not significant ($p>0.05$) affected.

Keywords: *Performance, Dominant hand grip, Strength, Anthropometric Charecteristics*

INTRODUCTION

One of the most oldest and widespread sport is arm wrestling “Indian wrestling”, “iron arm”, “wrist wrestling”(7), briefly, it is defined as, without a specific period of time two competitors on a table called arm wrestling table and without making any fouls under referee observation requires to contact the competitors outer surface of their hand on the pad of the arm wrestling table or tries to compete to bring to the level of the pad. Arm wrestling competition can be made according to weight procedure and with preference of athletes can use the right or left arm (1). Athletes without age restriction compete under 3 groups; youngsters, adults and disabled. Men and women can participate in the competitions (6). Nowadays, this sport is emerging worldwide, with increasing number of athletes, since it can also be practiced by subjects with physical deficiency, such as the paraplegic and hemiplegics ones (8). Arm wrestling contests have become a common public event and even Professional sport (7). Although this sport is known to be first organised a competition in 1952 in the USA, the first official competition to be made in our country was able to be made 1998. Arm wrestling is made in over 100 countries throughout the world and the amount of members of the World Arm Wrestling Federation (WAF) is rapidly increasing (1).

Nowadays success is accepted by everybody as the most important social value. To do the best in every subject, to show the best performance, to improve oneself one step higher, has without doubt become a goal that is irrevocable (5). As the increase in the amount of people who plays this sport, to put forward the effectiveness of the components performance and planning the exercises according to these properties has become more and more important. But up until now there has not been any study found for physical compatibility that affects arm wrestling performance, technical & tactical and anthropometrical properties. As much as the arm wrestling sport looks as if it is a forceful sport at first, it is considered that the hand and arm anthropometrical properties are also significantly

effective in reflecting the present force to the competitor. Therefore, in this study the goal is to define the correlation of the competition performance and to define some of the anthropometrical properties of male arm wrestlers.

METHOD

STUDY DESIGN AND PARTICIPANTS:

In this study, athletes were chosen randomly and 53 male athletes who were voluntary and that attended the Turkish University Sports Federations Arm Wrestling Turkish Championship has participated. In the research the volunteers were informed of the study and the voluntary forms have been signed according to the Helsinki declaration. The subjects age, height and weight averages in sequence is 22,1±2,5 years, 1,74±0,08 mt and 79,4±17,2 kilogram.

DATA COLLECTION:

In the research scope, the dominant hand grip force and anthropometrical properties being height, weight, bicep circumference, humerus length, front arm circumference, front arm length, hand span length of the dominant hand and hand length parameters has been included. The measurements that are within the scope of the research has been made one day before the competition and after weight control by the same researcher. Within the scope of the study, in order to determine the subjects individual properties a form has been completed for the athletes containing name –surname, age, scales weight and dominant arm information, the other measurements have been made according to this information. In order to measure the students height measurements the (Holtain Ltd., UK) stadiotmeter which has an accuracy of ± 1mm, to measure their body weight the weighing machine (Omron BF - 510, Japan) which has an accuracy of ± 0.1kg has been used. The subjects height length has been measured at anatomic standing structure, barefoot, heels joint together, head at frontal plane position and has been recorded in cm, body weight of light garments, barefoot and at anatomic standing structure has been measured in kg unity (3). Hand griping force measurements between 0–100 kg was measured with (Takei Grip - d, Japan) hand dynamometer and the dynamometer was adjusted according to the subject hand measurement. Measurements were taken whilst subject was standing, with hands in hanging down position and without contact of the dynamometer to the body whilst the arm was at 45 degrees to the body was taken at maximum clench force. Separately the dominant hand was measured three times and the best value was recorded in kg unity (4). The circumference measurements (biceps circumference, humerus length, front arm length, hand span of the dominant hand, hand length) was taken with an anthropometrical tape metre (Gullick Meter) with a sensitivity of ± 1mm and has been recorded in cm unity (3).

STATISTICAL ANALYSES:

The SPSS 17 (SPSS Inc., Chicago, IL, USA) packet program was used in the analysis. In order to define the anthropometrical properties, hand grasp force averages and standard deviation values a definitive statistic has been used whilst with these values and the relationship between the competition performance has been looked at with the Pearson analysis and the relevance has been observed with 0.05 level.

RESULTS

84% of the athletes use the right arm as the dominant arm. When we take a look at the anthropometrical properties it is observed that the arithmetic average ± standard deviation (min-max) values for the biceps muscle circumference is 34,4±4,2 (25-44) cm., front arm circumference is 28,5±2,7 (22-34) cm, the humerus length is 37,2±2,7 (32-42) cm., the hand span length is 23,4±1,5 (20-27) cm. And the hand length is 20,1±1,4 cm. When the correlation values were examined of the hand griping forces it was observed that all of the anthropometrical properties were in the positive direction and significant ($p < 0.001$) interactive, it has been observed that the competition performance including the hand gripping force that no parameter was not significant ($p>0.05$) affected.

DISCUSSION

The aim of this research was to analyse the relationship between some of the anthropometrical features and the dominant grip strength value and their effect on the match performance of male grip strength athletes. According to the research findings including grip force no anthropometrical feature were found to affect the competition performance. One of the basic motor skills which defines sports efficiency is strength. In general it is defined as "The capability to withstand strength or to be able to withstand against strength for a period of time" (2). In arm wrestling the main muscles which are used are the finger, hand and arm, therefore a grip strength evaluation was concluded in order to show these muscles contraction strength. However, no relationship between these strength features and performance were found. The reason for this would be that during an arm wrestling competition apart from the finger and arm muscles a lot of other muscles groups are put into use and as a result of their interaction the amount of strength passed onto the opponent differs. Therefore when testing wrestler force a lot of different muscle groups (especially hand, finger, arm, upper part of the body) measurements should be included and a specifically developed force measurer at competition position and it is required with different techniques to measure the special force (explosive force and continual force) is required. The strength test device exclusively for this branch needs to be conducted using the test device while in wrestling position and with different techniques. These measurements will be more effective for force and types of force and the relationship between the arm wrestling competition performance. However much arm wrestling appears to be a strength sport, apart from strength, it is possible for many components such as speed, flexibility, technique, tactic, motivation etc. properties to influence the arm wrestling competition performance. The intelligibility of arm wrestling performance and the affecting properties will be much more effective with the recognition of the above mentioned points for researches to be made henceforward.

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