Investigation of Arm Circumference, Ankle Circumference, Elbow Width and Knee Width of Iran’s Elite 13 to 17 Years Old Male Swimmers

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ABSTRACT

According to data shortage of the research literature, the purpose of the present study was determination of arm circumference, ankle circumference, elbow width and knee width of Iran’s elite 13 to 17 years old male swimmers, who have 1st to 8th ranks in Iran. Fifty-two 13-17 years old male swimmers, who have 1st to 8th country ranks in various materials, were chosen purposefully and in access. Their arm circumference, ankle circumference, elbow width and knee width were measured, and mean and standard deviation were calculated. Arm circumference, ankle circumference, elbow width and knee width were calculated as 29.72±3.04 cm, 35.48±2.89 cm, 7.13±0.31 cm, 9.77±0.41 cm, respectively. The present results are some indices of Iran’s elite swimmers and could be noticed by swimming talent exploration instructors. However, before an accurate conclusion, further studies, specifically with separation of various swimming materials, are required, because of data shortcoming in the literature.

INTRODUCTION

By the daily increasing progress of science and technology, the sport hasn’t lagged behind this development. Outstanding sport records have been achieved, in comparison to the past. Nowadays, in order to achieve the improvement and progress apexes, regarding to the scientific principles is necessary, in sport. While viewing harmonic movements and execution of complicated skills of the champions, some questions come to mind; whether all of interested persons can reach themselves to the championships levels with specific exercises. Whether, the athletes must have especial physical and mental properties, to achieve the championship levels.

Whether, the instructor shall explore some specific persons with especial physical and mental characteristics, to compensate the shortcomings in the fields of sport competitions. And finally, what’s the index of becoming elite in each sport [1]? Because, the possession of anatomic and anthropometric properties is one of the important parameters of success acquirement in various sports, another question that could come to mind, is whether the instructors can identify the specific persons, who have the ability of becoming elite in a particular sport, and dedicate a meritorious help to the talent exploration process, by investigation of anthropometric properties of the athletes of various sports. Most researches have been guided toward an attempt to provide the understanding of the influence range of the athletes’ body scales and configurations on executions of various sports [15].

The anthropometric measurements have been mainly used in; (a) description of an athlete’s body in a particular sport [10,17], (b) comparison of physical differences in various sports and among both genders [3,14,19], (c) determining differences of race groups on clarifying the possible interpretations for their successes in a particular sport, for example; the dominance of the east of Africa in running [11], (d) and anthropometric variables as the key of execution quoting [7,8,17].

The physical scales correlate with each sport, in a particular manner. Some of specific indices might have more predominant and substantial role than other ones, in some sports. For example; height and height to weight ratio are very substantial in basketball and rowing, respectively. And, the ratios between different parts of the body and their harmonic growths are very important, in the other sports [4].

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The measurement of a morphological structure could be suitable, for determination of speed and endurance exercises. In the swimming sport, the body shape of the swimmer should be in a configuration that he has long trunk, hands and feet, big palms and metatarsus, broad shoulders, and narrower pelvis than his shoulders [9].

In this sport, the person are selected upon some certain criterions as the talent exploring indices, and this kind of selection is a very substantial factor in success and progress of the athlete toward the swimming championship levels [9]. One of the determinant criterions is possession of swimming anthropometric properties, which is also separated in regard of speed and endurance types [18].

In the competitive swimming, the athletes compete in 4 materials (crawl, backstroke, frog and butterfly stroke) in distances of 50 to 1500 meters [2]. The anthropometric scales are the important advantageous, for achievement of the superior performance and result, and record improvement [16].

The target the present study was determination of arm circumference, ankle circumference, elbow width and knee width of Iran’s elite 13 to 17 years old male swimmers, who have 1st to 8th ranks in Iran.

MATERIAL AND METHODS

Fifty-two 13-17 years old male swimmers, who acquired 1st to 8th ranks in various materials of the country swimming championship competitions, were chosen purposefully and in access, and their ages were recorded. Their arm circumference, ankle circumference, elbow width and knee width were measured by tape. The obtained values from the participants were described by the statistical methods of mean and standard deviation. The statistical software SPSS v.16 was used to carry out statistical calculations.

Results:

The statistical description of arm circumference, ankle circumference, elbow width and knee width of 13-17 years old male swimmers, who have 1st to 8th ranks in the country, has been represented in table 1.

Table 1: Statistical description of arm circumference, ankle circumference, elbow width and knee width of 13-17 years old men swimmers, having 1st to 8th ranks of the country.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean ± Standard deviation</th>
</tr>
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<tbody>
<tr>
<td>arm circumference (cm)</td>
<td>29.72±3.04</td>
</tr>
<tr>
<td>ankle circumference (cm)</td>
<td>35.48±2.89</td>
</tr>
<tr>
<td>elbow width (cm)</td>
<td>7.13±0.31</td>
</tr>
<tr>
<td>knee width (cm)</td>
<td>9.77±0.41</td>
</tr>
</tbody>
</table>

Arm circumference, ankle circumference, elbow width and knee width were calculated as 29.72±3.04 cm, 35.48±2.89 cm, 7.13±0.31 cm, 9.77±0.41 cm, respectively.

Chart 1: Statistical description of arm circumference, ankle circumference, elbow width and knee width of 13-17 years old men swimmers, having 1st to 8th ranks of the country.
Discussion:
Base on the results of the present study, arm circumference, ankle circumference, elbow width and knee width were calculated as 29.72±3.04 cm, 35.48±2.89 cm, 7.13±0.31 cm, 9.77±0.41 cm, respectively.

In another study, the physical scales and configurations of elite teenager and young girls were measured and studied, to compare with the characteristics of national and Olympic swimmers and those of non-athletes peers. Analogy of obtained results showed that the swimmers’ arm circumferences are similar to non-athletes’ ones, and the ankle circumference comply with body weight pattern. The pelvis width and especially the shoulders one are wider, among the swimmers [13].

A research, which carried out on various aspects of swimming applied physiology, distinguished that the female swimmers possess further lean body weight than the past ten years, and have fat percentages from 14 to 19 percent. Also, it was clarified the swimmers have greater open hands length to height ratio. In addition, it has been indicated that 100 m and 200 m crawl and backstroke swimmers are the tallest groups, in the swimming sport. Whereas, the frog and butterfly stroke swimmers have unique physical structures, and the frog swimmers are the shortest ones, among the swimmers [12].

Another study, which carried out by Helmut on forty-five 8-16 years female swimmers, has shown the athletes had taller height, heavier weight and wider shoulders than non-athletic peers. Also, a positive significant correlation was observed between times of 100 m crawl swimming with shoulders width, chest circumference, palms and metatarsus lengths and lean body weight [6].

Several other researchers showed a significant correlation between swimming execution with chest and shoulders circumferences [5,13] and palms length [2], too. However, there’re few previous researches in this field of study, and further investigations should be studied, yet. Definitely, no prosperity would achieve without any scientific plan, and the scientific plan requires analysis of some necessities, which are earned form these very scientific studies. The understanding of what anthropometric characteristics of an athlete are remarkable, could aid the instructors about concentration of the exercises, or might help them in prediction of which athlete has anthropometric capacity for prosperity. The knowledge of the successful athletes of a particular sport, who show the same anthropometric properties, is the key of a proper exercise schedule designation.

Conclusion:
The present results are some indices of Iran’s elite swimmers, and could be noticed by the swimming talent exploration instructors. However, before an accurate conclusion, further studies, specifically with separation of various swimming materials, are required, because of data shortcoming in the literature.

REFERENCES


