

Examination of Reaction Times of Athletes of Kyrgyz National Team during Preparation Period for 2016 Summer Olympic Games¹

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Abstract

This research has been carried out in order to determine the reaction levels of Kyrgyzstan national team athletes during the preparation period before 2016 summer Olympic Games. 9 Greco-Roman style wrestlers (24 ± 4.5), 10 freestyle wrestlers ($22,10 \pm 3,21$), 8 judoists ($23,6 \pm 1.89$), 8 male athletes ($22,29 \pm 2.87$) and 3 female athletes (21.67 ± 2.08), totally 35 male and 3 female national athletes have been included to the study. The reaction times of the athletes against sound and light have been determined by the Newtest 1000 brand multi-choice reaction time scale. Statistical evaluation of the study has been carried out by SPSS 21.0 computer package program and "One Way ANOVA" test has been used to determine the difference between the groups. The differences on $P < 0.05$ has been considered significant. When the findings were examined, Greco-Roman style wrestling, freestyle wrestling and judoists' reaction times reflected statistically similar results ($p > 0,05$). Greco-Roman style wrestlers' reaction times have been found significantly higher than male and female athletes ($p < 0,05$). Freestyle wrestlers, judoists, male and female athletes scores haven't statistically reflected difference ($p > 0,05$). No statistically significant difference was found among the left hand reaction times of the branches ($p > 0,05$). When the obtained results are examined, it has been observed that the right hand reaction times of the athletics are better than the wrestling and judo which are the branches of the fight sports.

Keywords: Reaction Time, Sports, Kyrgyzstan

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Introduction

The reaction time is defined as the unit of time elapsed between the presentation of one possible stimulus and the beginning of the person's response voluntarily given to this stimulus (Angell and Moore, 2000).

Reaction time is an interval of time between the application of a stimulus and the beginning of an appropriate voluntary response by the subject (Karakuş et al., 1996; Terzioğlu, 1974). For our perceptions, in enabling athletes to act and react earlier than their opponents in sports the shortness of reaction time is important, especially in terms of stimulus. In addition, it has been stated that, the importance of reaction time may differ from one branch to another (Karakul, 1996).

In sport performances, reaction and action times are known as one of the important parameters of the speed, which is considered to be one of those motoric characteristics. (Karakuş et al., 1996). For this reason, the role of reaction time in Sport is becoming much more important. It was remarked that, athletes with short reaction times were more successful among athletes with the same conditional characteristics and technical capacities (Açıkada, 1990). Reaction time is a decisive criterion in many sports branches and along with many year researches, the shortening of the reaction time has been gained and become compulsory (Catelli, 1990).

It has been affirmed that the Reaction time is an amount of time period during which sudden and unplanned signal is presented and response to this signal is given, and that the stimuli can be auditory, visual and tactile (Eniseler, 1995) It has been confirmed that, the reaction time is considered to be one of the determinants of performance in modern sport and is closely related to the possession of quick decision making skills of athletes who are under the pressure of time and rival (İmamoğlu and Kılıçgil, 2007).

Reaction time is important in all sports branches. Researchers reported that with the help of physical trainings reaction times can be shortened (Angell and Moore, 2000; Biçer and Aysan, 2008; Çolakoğlu et al., 1993). Athletes with fast reaction times may have more advantages in competitions than their opponents, as the reaction time is one of the criteria used to determine the competition winner.

Materials and Methods

In this study, the reaction times of athletes from 4 different branches of National team of Kyrgyzstan during the preparatory period before 2016 Summer Olympic Games were examined. A total of 38 athletes included in the preparations for 2016 summer Olympic games in the national team of Kyrgyzstan from the branches of Greco-Roman Wrestling (9), Free style Wrestling (10), judo (8), male athleticism (8) and female athleticism (3) were involved in the research. The data of the research were collected under the Scientific Research Project.

Height and Body Weight Measurement

The subjects have been weighed in up to 20-gramm sensitive weighbridge with bare feet and shorts only. Length measurements were made with the Holtain slide callipers while the subjects were standing in upright position having the callipers that slide along the scale adjusted so that they can touch the heads and read with an accuracy of 1 mm in length.

Reaction Time Measurement

In the study, the visual reaction times of the subjects were determined using a Newtest 1000 instrument. In the reaction time measurements, it was taken into consideration that the place where the measurement is made should be noiseless and light environment. One trial against light stimuli from each subject and the results of 3 measurements was recorded. The mean of the last 3 tests was determined as the reaction time, accepting the first trial as a practice (Tamer, 1995). The measurement results of the subjects were recorded in milliseconds. The visual reaction of the athletes has been measured having index finger of the right and left hands right next to the button in joint position.

Statistical Evaluation

Statistical evaluation of the findings has been performed with SPSS 21.0 computer package program, and the arithmetic mean and standard deviation of all parameters were calculated. The "Single Sample Kolmogorov-Smirnov" test has been used to determine the homogeneity of the data. To determine the difference between the groups the "One Way ANOVA" test has been applied. Differences in $P < 0.05$ were considered significant.

Ethical Approval

Detailed information about the study was given to the subjects before the measurements and the voluntary confirmation form was signed. The study protocol was approved by the ethics committee of Kyrgyzstan State Sports Academy no: 2015/175.

Results

The demographic information of sportsmen from four different branches included in the researcher given in table 1.

Table 1. Demographic Characteristics of Kyrgyz National Athletes

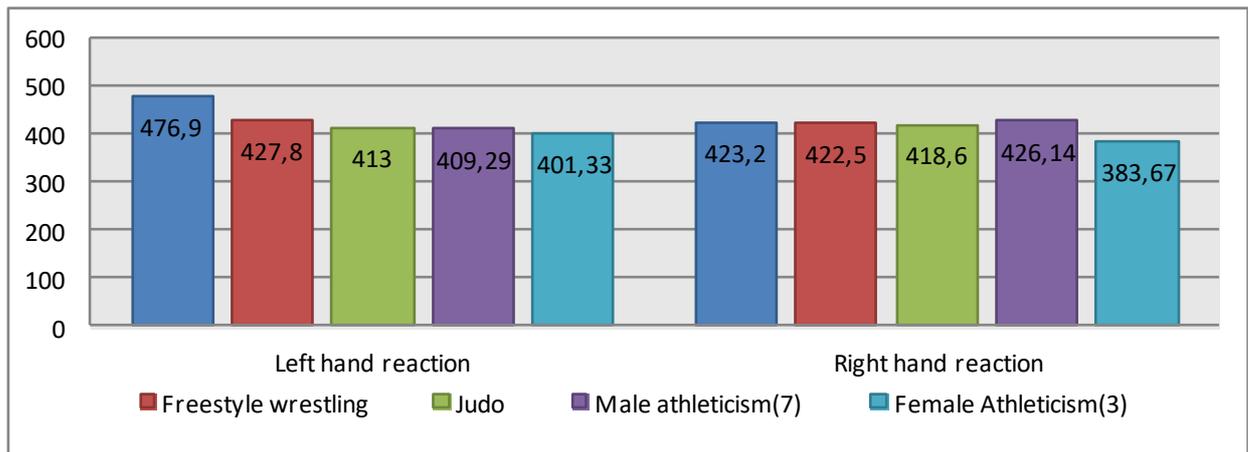
Branches	n	Age (Mean±sd)	Body length (Mean.±sd)	Body weight (Mean.±sd)
Greco-Roman wrestling	9(M)	24,00±4,50	169,60±9,44	72,02±11,80
Freestyle wrestling	10(M)	22,10±3,21	164,31±4,75	64,75±6,34
Judo	8(M)	23,6±1,89	175,7±36,87	86,2±20,27
Male athleticism	8(M)	22,29±2,87	177,88±6,31	64,98±2,72
Female athleticism	3(F)	21,67±2,08	171,66±2,51	56,5±8,58

Table 2. Right and left hand reaction measurements of National athletes of Kyrgyzstan (msn)

Branches	n	Right hand reaction (Mean ± sd)	Left hand reaction (Mean. ± sd)
Greco-Roman wrestling	9(M)	476,9±53,57 ^a	423,2±68,94 ⁻
Freestyle wrestling	10(M)	427,8±51,82 ^{ab}	422,5±75,22 ⁻
Judo	8(M)	413±88,14 ^{ab}	418,6±108,96 ⁻
Male athleticism	8(M)	409,29±63,6 ^b	426,14±72,51 ⁻
Female athleticism	3(F)	401,33±29,6 ^b	383,67±39,8 ⁻

-: P > 0.05 differences between the groups are insignificant, ab: P < 0,05 explains the differences between groups.

When the findings given in Table 2 were examined, Greco-Roman, freestyle wrestlers and judokas' reaction times did not show statistically similar results ($p > 0.05$). Reaction times of Greco-Roman style wrestlers were significantly higher than male and female athletes ($p < 0.05$). Scores of Freestyle wrestlers, judokas, male and female athletes did not reflect any statistical difference ($p > 0.05$). No statistically significant difference was found between the left hand reaction times of the branches ($p > 0.05$). As a result, when the obtained data were analyzed numerically, it was observed that athletic athletes' average reaction times reflected better scores from the fighting athletes than wrestling and judo branch athletes.



Graph 1. Graphical representation of right and left hand reactions of athletes

Discussion and Conclusion

Reaction time is a determining factor of performance in most sports. Measuring the reaction time is quite complicated, despite its simple definition. Relevant sense organs, stimulus intensity and circumstance are some of the factors that affect the reaction time. (Guyton and Hall, 2006).

In this study, right and left hand reaction times of athletes of National team of Kyrgyzstan measured during the preparatory period before 2016 Summer Olympic Games have been examined. The results indicated that, left hand reaction in Greco-Roman wrestlers were measured as 423.2 ± 68.94 ms while the right hand reaction was 476.9 ± 53.57 ms. In freestyle wrestlers, right hand reaction was measured as 427.8 ± 51.82 ms and left hand reaction 422.5 ± 75.22 ms. Right and left hand reactions in Judokas were measured as $413 \pm 88,14$ and $418,6 \pm 108,96$ ms. In male athletes the right hand reaction was $401,33 \pm 9,6$ ms, the left hand reaction was $426,14 \pm 72,51$ ms and the right and left hand reactions in female athletes were $401,33 \pm 9,6$ and $383,67 \pm 39,8$ ms. (table 2).

As it can be seen, averages of right hand reaction time of athletic athletes has reflected better scores than sportsmen of combat sports - wrestling and judo. Gürsoy et al. (2017) investigated the reaction times of 89 male and 30 female active athletes from different branches. As a result of their research, they noted that male athletes showed better results having $379,83 \pm 30,45$ ms right hand and $376,13 \pm 32,70$ ms left hand reaction time than those female athletes whose right hand reaction was $405,97 \pm 38,57$ ms while left hand reaction reached $390,10 \pm 39,54$ ms. In their researches of analysis of reaction time of 48 athletes from different branches, Pular et al. (2017) found the dominant hand reaction time of 12 athletes from athleticism to be $283,16 \pm 35,94$ and average reaction time of two hands as $320,71 \pm 82,23$ ms.

Cicioğlu et al (2006) determined the visual reaction times of the Greco-Roman National Wrestlers as 0.188 ± 0.07 ms. In his survey, conducted on 176 men and 129 women athletes from different branches, Akarsu (2004) reported that the right hand reaction time of male athletes was 407.11 ± 92.55 ms and the left hand reaction time was 401.61 ± 77.69 ms. At the same time, girls had right hand reaction time equal to 431.03 ± 88.76 ms, and left hand reaction time to 437.62 ± 84.39 ms. Dominant hand reaction time was 338.16 ± 61.59 ms in males and 354.01 ± 62.55 ms in females. As it is seen above, there are some researches where lower reaction time results are reported in literatures as well as those that support our results. It is believed that, it may have been caused by the differences in distance between specified finger and button before command during the data acquisition methods. In addition, the application of different model devices in the reaction measurements has been explained as another reason for the inconsistency in the reaction times reported in our investigations.

As a result, it is assumed that different sport activities have an important effect on the development of the motoric characteristics and reaction time in the human body in terms of physiology and that the activity type influences mentioned characteristics at different levels.

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Conflict of Interest

The authors have not declared any conflicts of interest.

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