

Impact of coordination training on the development of speed among young judokas from 10 to 12 years old

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Abstract

Purpose: Judo is a combat sport requiring physical qualities that include speed and coordination. They are essential for brief and intense attacks. Study the impact of a training based on coordination adapted to the age group (10 to 12 years) on the development of speediness among young's judokas.

Material: The study was conducted at Svelty Club, sports association in Kenitra, city in north-western Morocco, from March 2nd, 2019 to May 5th, 2019, on a sample of 12 young judoka aged from 10 to 12 years divided into two groups, control group and experimental group. At first both groups received two tests, 10m speed test and Uchi Komi test, which we considered initial tests. The experimental group had a training program spread over 12 weeks that focused on the development of speed through coordination. For the control group, we followed the regular training of the club. Both tests were re-administered after the end of the training program (final tests).

Results: The initial test value for the experimental group for Uchi Komi test was 7 ± 0.9 , and the final test was 8.7 ± 1.03 , which shows a significant difference according to the T test, ($p = 0.001 \leq 0.05$) in contrast to the control group ($p = 0.23 \geq 0.05$). For the 10m speed test, the experimental group showed a significant difference between the value of the initial test and the final test ($p = 0.003 \leq 0.05$), unlike the control group ($p = 0.93 \geq 0.05$).

Conclusions: The development of physical qualities is still the primary goal of coaches; however this development is more decisive for young athletes. Our study has shown that a coordination training adapted to each athlete's age can help coaches better develop other qualities namely speed.

Keywords: training, young, speed, coordination, judo, athlete.

Introduction

Judo is a highly demanding fighting sport. It requires the development of speediness for brief and intense maneuvers alongside endurance through the repetition of attacks. Furthermore, it prizes the mastery of coordination for an efficient execution of movements. A judo battle is composed of a succession of intermittent, brief and intense efforts, lasting a total of seven to eight minutes and inducing a strong demand of the different energy sectors [1-3].

A perfect physical condition is necessary for an optimal expression of the techniques that define the success of a judoka [4, 5]. For judo practitioners under 12 years of age the situation is a little more intricate. If the charge is univocal, early hyper-specific training can be problematic promoting muscle imbalances that could subsequently alter these young Judokas' development. Many children would not develop their maximum sport potential simply because the stimuli applied during their growth were insufficient or unambiguous. [6-8].

Hypothesis: Specific coordination training will have an impact on the development of speed among an age group of judokas from 10 to 12 years old.

Purpose: Study the impact of a training based on coordination adapted to the age group (10 to 12 years) focusing on the development of speediness among these young judokas through two tests, a speed test on 10m and a specific test Uchi Komi; a fundamental exercise in the physical and technical preparation of judoka [9].

Material and methods

Participants:

The present study was conducted at Svelty Club, sports association founded on October 13, 2013 in Kenitra, city in north-western Morocco, which contains over 80 licensees. The study was conducted from March 3rd, 2019 to May 4th, 2019, all Tuesday, Thursday and Saturday from 7 PM to 8 PM.

The population is made up of 12 male judokas from the club ASSOCIATION SVELTY CLUB. These subjects were chosen in a random way, forming two groups:

- *An experimental group* whose age was between 10 and 12 years, with a mean age of 11.33 ± 1.03 , and a weight between 41 and 78 kg and a mean of 53.33 ± 14.65 .

- *A control group* whose age was between 10 and 12 years, with a mean age of 11.33 ± 1.03 , and a weight between 40 and 55 kg, and a mean of 46.16 ± 5.78 .

Research Design:

Before applying the tests, both experimental and control groups perform specific warm-up exercises to avoid injury and prepare the muscle for exertion by increasing body temperature.

Step 1: Applying the initial tests to assess the initial level of each member of both groups (experimental and control).

Test 1: Speed test on 10m:

- The subject must be behind the starting line, the stopwatch is triggered when the subject's rear foot leaves the ground, and stops when he crosses the finish line, the subject must perform 3 tries and the best time is recorded

[10], the objective of this test is to evaluate the ability to start explosively.

Test 2: Uchi komi:

- The subject must perform the maximum number of repetitions on ippon-seoi-nage for 10 seconds, he must keep the rhythm adopted from the outset and especially the gestural quality at the time of execution of the technical gesture [11], however the test procedure must comply with the following conditions:

- Rotate completely and return from the front,
- Both feet on the same line,
- The hand back on the reverse.

Step 2: Development of an adapted training program focused on speed development through coordination (see Appendix):

After initial testing, we set up a specific training plan to develop speed among young judokas aged 10 to 12 years, while taking into consideration the fundamental principles of progression (from simple to complex), respect the stages of development, the load of the exercises and the principle effort-recovery.

The training program was spread over a period of 12 weeks, with three training sessions per week, making a total of 36 sessions lasting 60 minutes each.

Step 3: repeat the tests (10m speed test and Uchi Komi test) under the same conditions of the initial tests that we will consider final tests.

Statistical analysis:

For the analysis of the evolution between the two groups we chose T test of the paired samples, with the software SPSS version 25.

Results

Descriptive results

According to Table 1 the experimental group has a mean age of 11.33 ± 1.03 , and the average of the results of the initial and the final test for the speed in 10 meters are respectively (2.35 ± 0.09) , (2.25 ± 0.06) .

For Uchi Komi test the mean of the initial and final test results are respectively (7 ± 0.9) , (8.7 ± 1.03) .

From Table 2 the control group has a mean age of 11.33 ± 1.03 , as well as the average of the results of the initial and the final test for the speed in 10 meter are respectively (2.61 ± 0.25) , (2.60 ± 0.19) .

For Uchi Komi test the average of the initial and final test results are respectively (6.67 ± 1.37) , (7.67 ± 1.21) .

Results of the comparison between the experimental group and the control group.

- Speed test on 10m in (s)

- For the experimental group and from Table 3, the average of the initial test was 2.35 ± 0.09 , and the final test was 2.25 ± 0.06 , which proves an evolution of 0.1 (s). And this is confirmed by the paired sample T-test, which shows that there is a significant difference between the value of

Table 1. General characteristics of the sample as well as the results of the initial and final tests of the two tests (speed over 10 m and Uchi Komi by 10 seconds (Ippon Seoi Nage)) for the experimental group.

Subjectcs	Ages (years)	Weight (kg)	Grades	IT*: 10m (s)	FT*: 10m (s)	IT : Uchi Komi	FT: Uchi Komi
1	12	43	Blue	2.30	2.18	8	10
2	12	59	Blue	2.41	2.32	8	9
3	10	41	Blue	2.47	2.33	6	7
4	12	78	yellow	2.25	2.19	7	9
5	12	58	white	2.29	2.25	7	9
6	10	41	white	2.40	2.25	6	8
****	11.33±1.0	53.3±14.65	****	2.35±0.09	2.25±0.06	7±0.9	8.7±1.03

Note: IT*: Initial test, FT*: Final test.

Table 2. General characteristics of the sample as well as the results of the initial and final tests of the two tests (speed over 10 m and Uchi Komi by 10 seconds (Ippon Seoi Nage)) for the control group.

Subjects	Ages	weight (kg)	Grades	IT*: 10m (s)	FT 10m (s)	IT*: Uchi Komi	FT*: Uchi Komi
1	12	40	Blue	2,15	2,29	9	7
2	10	40	Green	2,70	2,71	7	9
3	12	55	Orange	2,85	2,65	7	9
4	12	45	Orange	2,60	2,50	6	6
5	12	48	White	2,81	2,86	5	8
6	10	49	white	2,53	2,60	6	7
****	11.33±1.03	46.16±5.7	*****	2.61±0.25	2.60±0.19	6.67±1.37	7.67±1.21

Note: IT*: Initial test, FT*: Final test.

Table 3. Comparison of the initial and the final test of 10m speed test between the two groups

Experimental Groupe			Control Groupe		
Initial test	Final test	Sig*	Initial test	Final test	Sig*
A*± Sd*	A*± Sd*	0.003	A*± Sd*	A*± Sd*	0.93
2.35±0.09	2.25±0.06		2.61±0.25	2.60±0.19	

Note: A*: average, Sd*: standard deviation Sig*: signification.

Table 4. Comparison of the initial and the final test of Uchi Komi test of 10 seconds (Ippon Seoi Nage) between the two groups

Experimental Groupe			Control Groupe		
Initial test	Final test	Sig*	Initial test	Final test	Sig*
A*± Sd*	A*± Sd*	0.001	A*± Sd*	A*± Sd*	0.23
7±0.9	8.7±1.03		6.67±1.37	7.67±1.21	

Note: A*: average, Sd*: standard deviation Sig*: signification.

the initial test and the final test ($p = 0.003 \leq 0.05$).

- For the control group and from Table 3, the average of the initial test was 2.61 ± 0.25 , and the final test was 2.60 ± 0.19 , which proves a difference of 0.01, but based on the paired T-samples test, we can see that there is no statistically significant difference ($p = 0.93 \geq 0.05$).

- *Uchi Komi test of 10 seconds (Ippon Seoi Nage)*

- For the experimental group and from Table 4, the average of the initial test was 7 ± 0.9 , and the final test was 8.7 ± 1.03 , which proves an evolution of about 1.7 And this is confirmed by the paired sample T test, which demonstrates that there is a significant difference between the value of the initial test and the final test ($p = 0.001 \leq 0.05$).

- For the control group and from Table 4, the average of the initial test was 6.67 ± 1.37 , and the final test was 7.67 ± 1.21 , which proves a difference of the order of 1, but based on the T-test of paired samples, we find that this evolution is not statistically significant ($p = 0.23 \geq 0.05$), and thereafter it is not considerable.

Discussion

According to Table 1 and 2, the experimental group and the control group have the same middle age (11.33 ± 1.03), and this was part of the sample choices in order to have the same starting conditions for both study groups.

According to both Tables 3 and 4, comparing the results of the initial test (2.35 ± 0.09) and final test (2.25 ± 0.06) for the test of speed of 10 meters for the experimental group, we manage to have an evolution of the order of 0.1 (s), and this is was confirmed by the T-test of paired samples, which shows that there is a significant difference between the value of the two initial and final tests ($p = 0.003 \leq 0.05$). The same result was recorded for Uchi Komi test ($p = 0.001 \leq 0.05$), between the initial test (7 ± 0.9) and the final test (8.7 ± 1.03), while in the control group the results for either the 10m speed test or Uchi Komi test are not significant respectively ($p = 0.93 \geq 0.05$), ($p = 0.23 \geq 0.05$).

These encouraging results can only be explained by the effectiveness of the training program developed and applied during the experimental period (12 weeks), and of course by the impact of coordination on the development of physical qualities, and this was widely discussed in several scientific articles on judo and other combat sports: fencing [12-15], judo [16-18], wrestling [19, 20], kickboxing [21, 22], taekwondo [19, 21, 23], but other authors put forward very different and different opinions regarding the experimental data on the importance of particular coordination in combat sports, a researcher named Petrow in 1997 [24], claims that no scientist has further determined the structure of coordination motor skills that significantly affect performance in certain combat sports.

Conclusion

The development of physical qualities is still the primary goal of coaches; however, this development is more decisive for young athletes. Our study has shown that a coordination training that is age adapted can help coaches better develop a number of qualities namely speediness.

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Contributions of the authors

All the authors contributed to the conduct of this work.

Conflicts of interest

The authors declare no conflict of interest.

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