

RESEARCH OF KINEMATIC CHARACTERISTICS OF BASIC ATTACKING TECHNICAL ACTION YOUNG WRESTLERS FREESTYLE

Yaremenko W.W.

National University of the State Tax Service of Ukraine.

Annotation. *Purpose.* Identified temporal characteristic structures basic attacking technicians action young wrestlers freestyle different qualifications. *Material.* The study involved 38 boys engaged in freestyle wrestling. Held analysis specially scientifically literature evidenced about that exists objective necessity at decisions question concerning study biomechanical speciality technicians wrestlers freestyle for working technology formation sports technicians athlete during pre-basic training. *Results.* Identified biomechanical characteristics defined kinematic structure of the temporal and spatial-temporal characteristics of the basic techniques. Shown variability of the individual phases of the basic techniques. *Conclusions.* Research duration preparatory, basic and final phases basic attacking technical action at stand young wrestlers freestyle different qualifications testifies about her variability and ambiguous at each studied technical action.

Keywords: structure, stand, techniques, young wrestlers, freestyle.

Introduction

Popularity of Olympic sports in modern world, its intensive commercialization and professionalization, constantly increasing social-political significance of victories at Olympic Games and winter Olympic Games have resulted recent years in formation of highly effective systems of sportsmen's training in many countries. This resulted in sharp increasing of competitiveness at international sport arena. The greater quantity of countries pretend on the highest medals in different kinds of sports [7, 12].

The above said concerns free style wrestling as well. To day free style wrestling duels are much quicker and active; referees encourage continuously attacking actions. It requires from sportsmen quick solution of technical-tactic tasks and application of different attacking combinations [3,11]. Scientific ideas of specialists [10], dealing with formation of junior wrestlers' techniques are of the same opinion that for increasing of effectiveness of technical training it is necessary to use achievements of modern sport science.

In compliance with modern ideas [5,6,9,11] technique is a single, holistic movement, which consists of separate (elementary) movements of arms, legs and torso, coordinated in time and space. In sport wrestling there are:

- movements of arms: grasp, seizure, scissors, pressing, pushing, jerk (upward, downward, aside, combined), push (upward, downward), pulling, leverage, pressing and so on;
- movements of legs: sub-placing, replacing, placing out, step from behind, pushing, leverage and so on;
- movements of torso: bending, straightening, arching, turn, rotation, bent [9].

Numerous researches in sport wrestling [1, 4, 11] permitted to determine the structure of techniques, which includes the following phases of movements:

- 1) Preparatory (preliminary) actions (seizure, coming of attacker from initial position to start, unbalancing of adversary);
- 2) Main actions (separation of adversary from mat, finalizing of unbalancing, turn, start of falling);
- 3) Finalizing (falling, flight, landing).

Success of a technique to large extent depends on quality of first phase's, preliminary actions' execution, which are targeted at accumulation of mechanical energy for further attacking actions. Researches of a number of specialists [4, 8] have proved that the first phase is longer than the second; besides, it was stated that incorrect coming in start position results in failure of throw. In second phase the most responsible actions are fulfilled, that is why it should be regarded as a determining one but from point of view of its effectiveness and as principle of rational building of throw training methodic. Main aim of movements in this phase is successful realization of mechanical energy accumulated in previous phase. Movements of the third phase are oriented on correction of the applied technique for gaining of additional points and so on.

According to literature data [2,6,8,10,13] kinematic structure of techniques in wrestling has different time, time-space and dynamic characteristics in connection with its variability. Owing to difference of structural elements of techniques it is necessary to study and form of junior wrestlers' optimal rhythmic components. Especially it is important when training basic attacking techniques of junior wrestlers. All above mentioned served as the basis for studying of time characteristics of junior free style wrestlers' some attack techniques in standing posture.

The work has been fulfilled as per "Combined plan of S&RW in sphere of physical culture and sports for 2011-2015" of Ministry of Ukraine of family, youth and sports by topic "Individualization of training process of qualified martial art sportsmen". State registration number: 0111U0001723.

Purpose, tasks of the work, material and methods

The purpose of the work is to determine time characteristics of junior free style wrestlers' of different qualification basic attacking techniques in stance.

The methods of the research: analysis of special scientific-methodic literature, pedagogic observations, video-metering, bio-chemical analysis, methods of mathematical statistics.

Results of the research

In the course of stating experiment we studied duration of three phases (preparatory, main and finalizing) with fulfillment by junior wrestlers of different qualification of the following basic attacking techniques: displacement by jerk on neck and arm, throw by two legs with bent, throw "mill", knocking down by pull legs, knocking down by twisting of arm and neck.

The received data witness that duration of wrestlers' first phase (displacement by jerk of arms and neck) was in average 0.44 sec (S=0.04 sec), 2nd phase (main) – 0.16 sec (S=0.02 sec), 3rd phase (final) - 0.32 sec (S=0.01 sec) (see table 1)

Table 1

Duration of separate phases of technique "displacement by jerking of arm and neck"

Phases	Time structure indicators of technique	Qualification of sportsmen					
		MS (n=12)		CMS(n=12)		I grade(n=14)	
		\bar{x}	S	\bar{x}	S	\bar{x}	S
1 phase	Time, sec	0.44	0.04	0.52*	0.05	0.56*	0.06
2 phase	Time, sec	0.16	0.02	0.2	0.02	0.24*	0.03
3 phase	Time, sec	0.32	0.01	0.36	0.05	0.44*	0.04
Total duration of technique		0.92	0.07	1.08*	0.09	1.24*	0.09

* - p<0.05 (difference from MS group)

It is interesting to know that CMS wrestlers demonstrated the following indicators in this technique: duration of 1st phase was in average 0.44 sec. (S=0.05 sec.), 2nd phase – 0.2 sec. (S=0.02 sec.), 3rd phase was 0.36 sec. (S=0.05 sec.). It is necessary to note that duration of fulfillment of the tested phases by CMS was statistically confidently higher that of MS (p<0.05). The same picture is observed with fulfillment of this technique by 1st grade sportsmen. Duration of the 1st phase was in average (0.56 sec. (S=0.06 sec), 2nd phase– 0.24 sec. (S=0.03 sec), 3rd phase– 0.44 sec. (S=0.09 sec.).

As received facts witness duration of the 1st phase of technique "throw with bent, holding by two legs" of MS was in average 0.44 sec. (S=0.05 sec.), 2nd phase – 0.36 sec. (S=0.02 sec.), 3rd phase – 0.36 sec. (S=0.06 sec.) (see table 2).

Table 2

Duration of separate phases of technique "throw with bent, holding by two legs"

Phases	Indicators of technique's time structure	Qualification of sportsmen					
		MS (n=12)		CMS (n=12)		I grade (n=14)	
		\bar{x}	S	\bar{x}	S	\bar{x}	S
1 phase	Time, sec.	0.44	0.05	0.48	0.05	0.6*	0.07
2 phase	Time, sec.	0.36	0.03	0.36	0.04	0.4	0.03
3 phase	Time, sec.	0.36	0.06	0.44*	0.08	0.48*	0.08
Total duration of technique		1.16	0.11	1.28*	0.13	1.48*	0.127

* - p<0.05 (difference from MS group)

In its turn wrestlers, who have CMS degree, demonstrated the following indicators of phases' duration with fulfillment of "throw with bent, holding by two legs": 1st phase – 0.48 sec. (S=0.05sec.), 2nd phase– 0.36 sec. (S=0.04 sec.), 3rd phase – 0.44 sec. (S=0.08 sec.) accordingly. It is important to note that duration of 3rd phase and duration of the whole technique, fulfilled by CMS, are statistically higher than of MS sportsmen (p<0.05). It is also necessary to note that 1st grade sportsmen showed the following results: 1st phase was 0.6 sec. (S=0.07sec.), 2nd phase– 0.4 sec. (S=0.03 sec.), 3rd phase– 0.48 sec. (S=0.08 sec.). According to obtained data duration of 1st and 3rd phases and of all technique throw with bent, holding by two legs, fulfilled by 1st grade sportsmen is statistically confidently higher comparing with indicators of MS (p<0.05).

As analysis of experimental data, obtained for throw "mill", showed duration of CMS 1st phase and duration of all three phases of 1st grade sportsmen were confidently higher than of MS (p<0.05) (see table 3).

Table 3

Duration of separate phases of technique "throw "mill""

Phases	Indicators of technique's time structure	Qualification of sportsmen					
		MS (n=12)		CMS (n=12)		I grade (n=14)	
		\bar{x}	S	\bar{x}	S	\bar{x}	S
1 phase	Time, sec.	0.52	0.06	0.64*	0.04	0.76*	0.07
2 phase	Time, sec.	0.08	0.01	0.12	0.01	0.16*	0.02
3 phase	Time, sec.	0.24	0.02	0.32	0.02	0.36*	0.03
Total duration of technique		0.84	0.09	1.08	0.14	1.28*	0.09

* - p<0.05 (difference from MS group)

Duration of MS' sportsmen's 1st phase in average was 0,52 sec. (S=0.06 sec.), 2nd phase – 0.08 sec. (S=0.01 sec.), 3rd phase - 0.24 sec. (S=0.02 sec.) accordingly. The same of CMS was 0.64 sec. (S=0.04 sec.), 2nd phase – 0.12 sec. (S=0.01sec.), and 3rd phase – 0.32sec. (S=0.02 sec.). At the same time 1st grade sportsmen had indicators of 1st phase duration was in average 0.76 sec. (S=0.07 sec.), 2nd phase – 0.16 sec. (S=0.02 sec.), and 3rd phase – 0.36 sec. (S=0.09 sec.).

Analysis of phases' duration with fulfillment of technique "knocking down by pushing legs" by MS sportsmen showed that duration of 1st phase was in average 0.28 sec. (S=0.02 sec.), 2nd phase – 0.16 sec. (S=0.01 sec.), 3rd phase 0.28 sec. (S=0.02 sec.) (see table 4).

Table 4

Duration of separate phases of technique "throw "mill""

Phases	Indicators of technique's time structure	Qualification of sportsmen					
		MS (n=12)		CMS (n=12)		I grade (n=14)	
		\bar{x}	S	\bar{x}	S	\bar{x}	S
1 phase	Time, sec.	0,28	0,02	0,32	0,02	0,36*	0,03
2 phase	Time, sec.	0,16	0,01	0,16	0,02	0,2	0,03
3 phase	Time, sec.	0,28	0,02	0,44*	0,06	0,52*	0,05
Total duration of technique		0,72	0,06	0,92*	0,08	1,08	0,11

* - p<0.05 (difference from MS group)

It should be noted that wrestlers, CMS showed the following results: duration of 1st phase in average was 0.32 sec. (S=0.02 sec.), 2nd phase – 0.16 sec. (S=0.02 sec.), and 3rd phase – 0.44 sec. (S=0.02 sec.). At the same time 1st grade sportsmen showed the following indicators of 1st phase: 0.36 sec. (S=0.03 sec.), 2nd phase – 0.2 sec. (S=0.03 sec.), 3rd phase – 0.52 sec. (S=0.05 sec.). According to obtained data duration of 3rd phase and all technique knocking down by pushing legs, fulfilled by CMS as well as duration of 1st and 3rd phases and all technique, fulfilled by 1st grade sportsmen were confidently higher than of MS sportsmen (p<0.05).

The received facts witness that with fulfillment of "knocking down by twisting arm and neck" by MS sportsmen duration of 1st phase in average was 0.44 sec. (S=0.03 sec.), 2nd phase – 0.16 sec. (S=0.01 sec.), and 3rd phase – 0.32 sec. (S=0.04 sec.). The 1st phase of CMS was in average 0.52 sec. (S=0.03 sec.), 2nd phase – 0.2 sec. (S=0.02 sec.), 3rd phase – 0.36 sec. (S=0.06 sec.), duration of 1st phase of 1st grade sportsmen was in average 0.56 sec. (S=0.04 sec.), 2nd phase – in average 0.24 sec. (S=0.02 sec.), 3rd phase - 0.4 sec. (S=0.03 sec.) (see table 5).

Table 5

Duration of separate phases of technique "knocking down by twisting of arms and neck"

Phases	Indicators of technique's time structure	Qualification of sportsmen					
		MS (n=12)		CMS (n=12)		I grade (n=14)	
		\bar{x}	S	\bar{x}	S	\bar{x}	S
1 phase	Time, sec.	0.44	0.03	0.52*	0.03	0.56*	0.04
2 phase	Time, sec.	0.16	0.01	0.2	0.02	0.24*	0.02
3 phase	Time, sec.	0.32	0.04	0.36	0.06	0.4*	0.03
Total duration of technique		0.92	0.08	1.08*	0.08	1.20*	0.11

* - p<0.05 (difference from MS group)

It should be noted that duration of 1st phase and all technique "knocking down by twisting arm and neck", fulfilled by CMS sportsmen as well as duration of all three phases and all technique, fulfilled by 1st grade sportsmen, comparing with MS sportsmen, were confidently higher (p<0.05).

Conclusions:

Studying of time structure of basic attacking techniques in stance: displacement by jerking of arm and neck, throw with bent, seizing two legs, throw "mill", "knocking down by pushing legs, knocking down by twisting of arm

and leg of junior free style wrestlers witnesses about variability and non-uniformity of the researched characteristics in every technique. For example, MS sportsmen, when fulfilling technique “displacement by jerking of arm and neck” duration of 1st phase was in average 0.44 sec. (S=0.04s sec.), 2nd (main) phase – 0.16 sec. (S=0.02 sec.), 3rd (final) phase – 0.32 sec.(S=0.01 sec.). At the same time, CMS wrestlers demonstrated the following indicators in this technique: duration of 1st phase was in average 0.44 sec. (S=0.05 sec.), 2nd phase – 0.2 sec. (S=0.02 sec.), 3rd phase was 0.36 sec. (S=0.05 sec.), sportsmen of 1st grade demonstrated the following indicators: duration of 1st phase was in average 0.56 sec. (S=0.06 sec.), 2nd phase – 0.24 sec. (S=0.03 sec.), 3rd phase – 0.44 sec. (S=0.09 sec.) accordingly. It was found that duration of the researched phases of this technique, fulfilled by CMS sportsmen and by sportsmen of 1st grade were confidently higher than of MS sportsmen (p<0.05).

The prospects of further researches imply specification and expansion of computer technologies’ application in formation of sport technique of free style wrestlers at stage of preliminary basic training.

References:

- 1 Alikhanov I.I. *Teoriia i praktika fizicheskoy kul'tury* [Theory and practice of physical culture], 1984, vol.12, pp. 8–10.
- 2 Laputin A. M. *Biomekhanika sportu* [Biomechanics of sport], Kiev, Olympic Literature, 2005, 320 p.
- 3 Latishev S.V., Shandrigos' V.I. *Vil'na borot'ba* [Wrestling], Kiev, ASBU, 2011, 95 p.
- 4 Ivanov I. I., Kuznecov A. S., Samurgashev R. V., Shulika Iu. A. *Greko-rimskaia bor'ba* [Greco-Roman wrestling], Rostov on Don, Phoenix, 2004, 800 p.
- 5 Kupcov. A. P. *Teoriia i praktika fizicheskoy kul'tury* [Theory and practice of physical culture], 1999, vol.2, pp. 22–26.
- 6 Muntian V.S. Sovershenstvovanie tekhniko-takticheskogo masterstva sportsmenov v edinoborstvakh na osnove ucheta biomekhanicheskikh kharakteristik tekhnicheskikh priemov [Improving the technical and tactical skills in martial arts athletes based on biomechanical characteristics of accounting techniques]. *Aktual'nye problemy sovremennoj biomekhaniki fizicheskogo vospitaniia i sporta* [Actual problems of modern biomechanics of physical education and sport], Chernihiv, CHDPU, 2008, pp. 442–449.
- 7 Platonov V.N. *Periodizaciia sportivnoj podgotovki* [Periodization of athletic training], Kiev, Olympic Literature, 2013, 624 p.
- 8 Sinigovec S.V. *Pedagogika, psihologia ta mediko-biologicni problemi fizicnogo viovanna i sportu* [Pedagogics, psychology, medical-biological problems of physical training and sports], 2013, vol.7, pp. 62–69.
- 9 Kupcov A.P. *Sportivnaia bor'ba* [Combat sport], Moscow, Physical Culture and Sport, 1978, 424 p.
- 10 Tupeev Iu.V. *Fiziceskoe vospitanie studentov* [Physical Education of Students], 2010, vol.1, pp. 106–108.
- 11 Shakhmuradov Iu.A. *Vol'nay bor'ba* [Wrestling], Moscow, High school, 1997, 189 p.
- 12 Shinkaruk O. A. *Otbor sportsmenov i orientaciia ikh podgotovki v processe mnogoletnego sovershenstvovaniia* [The selection of athletes and their orientation in the process of preparation of long-term improvement], Kiev, Olympic Literature, 2011, 360 p.
- 13 Platonov V.N., Bulatova M.M. , Kashuba V.A. Biomechanical ergogenic means in modern sport. *Sport science. [Stiinta sportului]*. 2006, vol.53, 19 – 49.
- 14 Schmidt W. D., Piencikowski C.L., Vandervest R.E. Effects of competitive wrestling season on body composition, strength, and power in national collegiate athletic association division III college wrestlers. *Journal of Strength and Conditioning Research*, 2005, vol.19, pp. 505–508.
- 15 Vardar S.A., Tezel S., Ozturk L., Kaya O. The relationship between body composition and anaerobic performance of elite young wrestlers. *Journal of Sports Science and Medicine*, 2007, vol. 6, pp. 34–38.

Information about the author

Yaremenko W.W.: ORCID: 0000-0001-7496-0272; yarykk@mail.ru;
National University of the State Tax Service of Ukraine; K.Marksa str.31,
Irpin, Kiev region, 08200, Ukraine

Cite this article as: Yaremenko W.W. Research of kinematic characteristics of basic attacking technical action young wrestlers freestyle. *Physical education of students*, 2014, vol.2, pp. 56-60. doi:10.6084/m9.figshare.907016

The electronic version of this article is the complete one and can be found online at: <http://www.sportpedagogy.org.ua/html/anhive-e.html>

This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited (<http://creativecommons.org/licenses/by/3.0/deed.en>).

Received: 26.12.2013
Published: 31.12.2013