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Model Wrestlers in Freestyle Women's Wrestling

Boris Podlivaev¹

ABSTRACT. The efficiency of the training process in freestyle women's wrestling is largely conditional on the athletes' fitness and the model of their condition at various stages of long-term training. One of the most important components of female athletes' training is modeling their condition and the correction of the basic parameters of the training process based on the data of complex control. Development of the given "wrestler model" in freestyle women's wrestling is based on long-term research; it includes characteristics that reflect the state of various systems of the female athlete's body: the cardiorespiratory system (CRS), the neuromuscular system (NMS), and the central nervous system (CNS). "Weak" training links of athletes under review were discovered on the basis of research results. Methods of improvement were suggested.

Keywords: "wrestler model," performance, cardiovascular system, blood lactate concentration, central nervous system, aerobic and anaerobic capacity

Modern sports and wrestling in particular exact high demands on athletes' bodies. Given the high rates of competition, which increase at the final stage of training for the Olympic Games, the results of a match are often determined by the smallest fluctuations in homeostasis of the body's internal environment as well as those of the cardiovascular and nervous systems functions. Experience obtained with the Russian national freestyle wrestling team shows that basically every team member displays individual psychophysiological reactions to the training and competition load. Due to this, modeling the characteristics of female athletes' basic body systems and controlling the changes in them at various stages of training are the most important components of training.

RESEARCH RESULTS

The development of relevant models of fighting in wrestling is methodologically founded on the conclusion that processes of participation in competitions and training for them are dialectically integrated and opposed, and constitute inseparable components of athletic activity and one of the main conditions of its development (Igumenov, Piloyan, & Tumanyan, 1986).

Such a model allows, first of all, to evaluate the features of an upcoming competition and develop a dedicated training program for a serious competition, and second of all, to specify which information regarding the upcoming competition may prove useful and how it can be used in the training process, not only by one athlete, but the team as a whole.

The model of fighting in wrestling should reflect the following specifics and requirements:

An elite wrestler must:

- *possess a wide range of technical and tactical skills*, reliable defense and counterattacks, which let them score no less than 6–8 points in a match; apply grand amplitude throws; be able to hold an opponent in a position of danger and throw them; be able to execute standard techniques (foot hold, body hold in ground position and in standing position, ground wrestling); be able to wrestle in a cross hold (throw an opponent; force an opponent off the mat; when an opponent is about to apply a technique, prevent them from executing a technique or force them off the mat by blocking or maneuvering);
- *have a high level of physical fitness*, which allows them to apply techniques effectively at the start and at the end of the match (in spite of fatigue); be able to wrestle at a high functional level in extreme conditions; attacking the opponent with an interval of 20–25 seconds;

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- *possess tactical skill*, which allows them to apply his favorite tactical techniques with any opponent; to wrestle actively to apply a hold, to be able to wrestle for the surface of the mat; to wrestle actively on the entire surface of the mat, refining the following holds for this purpose: hold on wrist, hold on arm, front hold, hold from the side, hold from below, improve the ability to change a hold, ability to pursue an opponent up to the passivity zone and beyond, ability to take the lead tactically by executing an active maneuver, blocking an opponent by holds (hold on wrist, head-hold from above, hold on arm from the side, from below and by other holds in standing and in ground position); to be able to assess each situation on the mat quickly and in time, to assess the position of the feet, to assess shift in the center of gravity in relation to the area of support, to assess the style and the size of an opponent and other conditions characterizing the stability of opponents in various stances; to apply the winning formula in noncompetitive and competitive matches (to achieve victory by fall or by technical superiority over a weaker opponent or to gain more points when wrestling with a strong opponent; to end a period by a powerful spurt);
- *have psychological strength*, which facilitates maximum performance in extreme competitive situations.

Analysis of the competitive activity of the strongest Russian and foreign female athletes shows that skill in freestyle women's wrestling must be defined by the ability to compete intensively, maintain advantage gained, and create the appearance of active wrestling. A program of long-term training must be based on these requirements.

Long-term research of the specifics of using complex control to evaluate the fitness of highly qualified female athletes specializing in freestyle has enabled the development of model characteristics that reflect the state of various systems of the body.

Technical and Tactical Training

Analysis of competitive activity in women's freestyle wrestling throughout the last two Olympic cycles has shown that simple attacks to the legs and turning-down constitute 74% of the Technical Tactical Actions (TTA; Tünnemann, 2012). Performance of grand amplitude throws, which require a certain amount of time of training and entail certain risks, is minimal. They have made up only 3.4% of all techniques scored in world championship and Olympic competition.

In other words, women's wrestling technique is somewhat simpler than men's wrestling technique, which is why in women's training there must be adequate training tools that ensure the entertainment factor in wrestling. From this

angle, wrestling cannot be viewed as a set of holds. *A hold is just one of many elements, each of which may play a defining role in a particular match in modern competitions.*

The fundamental variety of technical and tactical actions in wrestling may be represented by the following basic technical and tactical wrestling elements:

- relative position of wrestlers,
- match background,
- execution of a hold,
- change of hold,
- getting free of a hold by blocks and leverages,
- maneuvering,
- pressing of an opponent,
- destabilizing an opponent to create a more favorable situation,
- making use of a favorable situation by applying a hold,
- position of a wrestler after an attack.

In relation to this, the main tasks that need to be solved during technical and tactical training can be formulated as follows:

- forming basic elements of wrestling technique and tactics;
- refining basic technical and tactical actions and forming favorite techniques with consideration of individual abilities; improving the skills that make it possible to wrestle various opponents and forming the skills for participating in serious events;
- improving tactical training, which allows:
 1. applying favorite holds in a match against any opponent;
 2. wrestling actively to apply a hold and dominate the mat area;
 3. wrestling actively across the entire area of the mat;
 4. being able to seize the upper hand tactically by using an active maneuver, pressing or immobilizing an opponent by applying submission holds;
 5. being able to assess the situation during the match quickly and in good time;
 6. applying winning formula in noncompetitive and competitive matches;
- forming wrestling skills based on current competition rules and referee requirements;
- creating competition situations and events during training;
- increasing the effectiveness of favorite technical and tactical actions and increasing the range of tactical skills and combinations based on individual traits and the level of fitness of potential opponents;
- improving skills necessary for taking part in serious competitions.

Consistent mastering of the *full range of technical and tactical wrestling elements* is the leading factor in the im-

TABLE 1 Model Characteristics of Competition Activity in Women's Wrestling

<i>№</i>	<i>Model Characteristics</i>	<i>Values</i>
1	Tactical fitness coefficient $TFC = \frac{TAg}{TAg + TAl}$	0,6–0,8
2	Number of points gained	5–6
3	Number of points lost	1–2
4	Effectiveness of attack activity points/min	0,8–1,2
5	Attack interval (AI), sec	20–25
7	Number of hold groups	3–4
8	Number of techniques	4–5

provement of qualified wrestlers' skills, which reflects current wrestling competition rules, because fighting in wrestling does not simply consist of implementing holds. A hold is but one of the many technical and tactical elements.

From this point of view, the main method of determining the content of female athletes' training should be the modeling of training exercises based firstly on the classification of technical and tactical elements in wrestling, and secondly, on the results from analyzing the competition activity of the strongest wrestlers. In this case, the following things are analyzed:

- effective technical and tactical actions, which constitute the skill set of the world's leading wrestlers;
- match wrestling tactics;
- specifics of current referee practice at important international judo championships.

Data in relation to the effective use of standard situations by wrestlers, which is gained during training and attacks, such as interim positions of wrestlers in relation to each other, is instrumental for developing the content of training exercises. Positions such as one of the wrestlers ending up behind his opponent, foot holds, and wrestling in ground position are the most frequent in sport practice.

Table 1 shows model characteristics, which reflect the basic parameters of competition activity in freestyle women's wrestling. In order to calculate the technical fitness coefficient (TFC), we used the following characteristics: TAG: technical actions gained; TAI: technical actions lost.

Physical Training

When choosing the methods of women's physical training it is important to *detect fatigue and athletes' overtraining*. This is crucial for the individualization of the training process and to prevent the causes of these conditions in time.

Normally, a decrease in training is related to a deterioration in physical or functional fitness. The usual recommendations in such cases are aimed at increasing lagging qualities in athletes so that they reach model levels of physical or functional fitness. Research (Korzhenevsky, Dakhnovsky, &

Podlivayev, 2004; Korzhenevsky, Smirnova, Podlivayev, & Tarakanov, 2014a, 2014b) shows that decrease in training efficiency is first and foremost related to a deterioration in the functional state of the central nervous system and the neuromuscular apparatus, which also leads to a deterioration in the cardiovascular system functions and physical performance.

The reaction of pulse and arterial blood pressure not only reflects the functional state of the cardiovascular system but of the body as a whole. It is related to the mechanism of voluntary and involuntary connections of the cerebral hemispheres' cortex, the locomotor apparatus, the cardiovascular system, and other internal organs providing increase in blood circulation, which is the basis of increased blood circulation due to physical exertion. Changes in nervous processes that condition a change in the activity of various systems cannot fail to affect the nature of response to such a voluntary and involuntary stimulus as physical exertion.

In contrast to general fatigue caused by factors of the cardiovascular system and psychological fatigue related to fatigue of the nervous system (Viru & Äkke, 1969; Wilmore & Costill, 1988), the term "muscle fatigue" has recently become more widely used, which refers exclusively to the fatigue of separate muscles or muscle groups (Monogarov, 1990; Seluyanov & Shes-takov, 2000). Muscle fatigue appears as a result of poor coordination of various systems of the body, the central of which is the central nervous system.

Considering that decrease in performance is closely connected to a deterioration in the functional state of the central nervous system and the neuromuscular apparatus, there is need in training methods for a wider use of exercises in sport practice, which improve coordination skills as a prerequisite for the development of spatial and temporal orientation (exercises, which require the head to move rapidly in different directions, right and left, body rotation, including with eyes closed and open, trampoline exercises, etc.), general and special coordination (rolls, turnovers, acrobatic exercises: walking on hands, kip-ups, front, back, side somersaults, performing favorite techniques from various holds, particularly at competition speed). On the one hand, this would increase the strength of sensory systems, which, in turn, would contribute to an increase in the strength of the central nervous system and an increase in its functionality, hence increasing physical performance. On the other hand, these exercises alongside the development of other physical qualities would significantly increase as yet untapped reserves of coordination skills, on which an increase in the effectiveness of technical and tactical actions during matches under competition conditions depends.

In order to achieve a high level of performance in acyclic work, which is what competition in wrestling is, it is crucial to possess a high level of muscular aerobic fitness (a large proportion of oxidative muscle fibers).

Our research results allow us to formulate the basic problems that need to be solved during physical training:

TABLE 2 Model Characteristics of Women's General Fitness in Freestyle Wrestling

Characteristics	Weight	Development Level of Characteristics Studied				
		Very Low	Low	Medium	High	Very High
Aerobic capacity	48–53 kg	<20	20–22	22–24	24–26	≥26
PWC 170 (kgm/min/kg)	55–63 kg	<22	22–24	24–26	26–28	≥28
	67–75 kg	<18	18–20	20–22	22–24	≥24
Aerobic capacity		<48	48–50	50–54	54–58	≥58
VO2 max (ml/min/kg)						
Alactic anaerobic capacity	48–53 kg	<36	36–42	42–48	48–54	≥54
Wmap (kgm/min/kg)	55–63 kg	<34	34–40	40–46	46–52	≥52
	67–75 kg	<30	30–36	36–42	42–48	≥48
Glycolitic anaerobic capacity	48–53 kg	<36	36–40	40–44	44–48	≥48
W 30" (kgm/min/kg)	55–63 kg	<34	34–38	38–44	44–48	≥48
	67–75 kg	<32	32–36	36–42	42–46	≥46

- training basic physical qualities;
- training specific physical qualities of:
 1. coordination,
 2. speed and strength, and
 3. localized muscle endurance;
- increase in functional fitness level;
- mastering the acceptable training load.

The most effective organizational and methodical form of developing wrestlers' motor skills is circuit training. The number of stations is conditional on the number of athletes in a group. Up to three athletes may train at each station. One athlete exercises, the other two rest. The approximate time of nonstop exercising is 20 seconds. During this time, the athletes repeat the exercise 10–12 times with a load of 40–60%. Time of rest is 40 seconds. In any case, the optimal number of stations is six to nine. In this case, the duration of one round is 6–9 minutes, which models the duration of a match. The number of rounds is four to eight and depends on the training stage and the athletes' fitness. The physiological exercise routine: the number and intensity of exercises are limited by a pulse rate of 140–160 beats per minute, rest—by the heart rate dropping to 120 beats per minute.

An athlete's functional fitness is determined by the characteristics reflecting general functional fitness (Table 2). Table 3 displays the criteria for evaluating functional fitness of wrestlers in various weight categories.

Table 4 presents the requirements for overall physical fitness (OPF) and special physical fitness (SPF). In order to achieve the expected results at the XXVIII Olympic Games in 2004, the team members must meet the requirements for OPF and SPF developed by taking account of the analysis of systematic test results of candidates and trainees of the Russian freestyle wrestling team at educational and training sessions (ETS) throughout 2009–2014.

Special Psychological Training

Tools and methods for psychologically correcting freestyle wrestlers must be chiefly aimed at altering (improving) their character, developing special skills and optimizing their psychological condition. These tools and methods form a unified structure known as “psychological training”. It can be divided into general (the one used in the daily training process) and special (the one used right before an event) training.

General psychological training solves the following problems:

1. improves motives for athletic training;
2. creates a positive attitude towards the training process;
3. develops better sides of athletic character and compensates for (levels) its weaker sides;
4. forms the psychological components of tactical skills (chiefly in sports games and matches);
5. develops the psychological qualities which define special sporting abilities.

Special psychological training in freestyle women's wrestling solves one major issue: it optimizes the psychological state of the athlete in the process of preparing for an important event. This includes adapting to various (pre-

TABLE 3 Criteria for Evaluation of Functional Fitness

Weight Categories	Lactate (mmol/l) After a Match	AP (mmHg) After a Match	Recovery Time
48–53 kg	9–13	Mx 180–200, Mn 20–0	4–5
55–63 kg	10–14	Mx 160–180, Mn 20–0	4–5
67–75 kg	8–11	Mx 160–180, Mn 20–0	5–6

TABLE 4 The Results of Physical Fitness Tests of Wrestlers in Different Weight Categories

<i>N</i> ₂	<i>Tests</i>	<i>48–53 kg</i>	<i>55–63 kg</i>	<i>69–75 kg</i>
1	Sprint 30 m, s	4,20	4,30	4,60
2	Sprint 60 m, s	8,10	8,00	7,90
3	Sprint 100 m, s	13,20	13,10	13,40
4	Standing long jump, cm	190	215	210
5	Standing triple jump, cm	625	650	640
8	Pull-ups, qty.	35	35	25
9	Pull-ups, qty, 20 s	24	21	16
10	Push-ups	5 rounds × 25 times (30 s. rest)		
11	Push-ups, qty, 20 s	32	44	36
12	Dips on parallel bars, qty.	30	21	18
13	Dips on parallel bars	5 rounds × 25 times (30 s. rest)		
14	4 m rope climb without legs, s	8.40	9.10	11.20
15	Close range kicking, qty., 20 s	25	24	21
16	Hanging leg raises, qty., 20 s	11	11	10
17	Sit-up, qty., 20 s	20	20	20
18	Stretching, qty., 20 s	24	22	21
19	Bench press, own weight, qty.	12	12	10
20	Bench press, own weight	3 rounds × 8 times (40 s. rest)		
21	Squat with a weight, kg	60–65	70–80	90–100
22	Squat with own weight	3 rounds × 8 times (40 s. rest)		
23	Sprint 400 m, min.,	1:10	1:12	1:14
24	Cross 2600 m, min.,	11:10	12:00	12:10
25	Cross 6 km, min.,	28:40	30:50	33:50
26	Change of position from bridge face down to bridge face up by moving feet (5 times to the left, 5 times to the right), s	14.0	14.5	15.0
27	10 turnovers on the bridge, s	15.0	15.5	18.0
28	Windmill throw in 20 s, qty.	11	11	10

dicted) competition situations, optimizing responsiveness to the effect of competitive wrestling conditions, eliminating negative displays of the athlete's personality (increased anxiety, uncontrolled aggression, emotional excitability, etc.), focusing on specific values that are most appropriate for the given athlete, formation of "inner psychological support" in her and her team, and optimizing "strong" character and temperament of a particular athlete.

Such factors as time and place of competition, the socio-psychological environment in the team, individual specifics of an athlete, as well as persons who apply correction

methods, affect the choice of specific tools and methods for psychological correction.

The most realistic ways to affect an athlete psychologically is for the coach to regulate things rationally and consult a psychologist.

The program of examining (testing) psychological states involves the state of the neuromuscular system (M-response threshold), central nervous system (number of errors in differentiated coordination tests and measurement of ocular motor reactions). Model characteristics of female athletes' psychophysiological traits are presented in Table 5.

TABLE 5 Model Characteristics of Psychophysiological Traits of Wrestlers

<i>Characteristics</i>	<i>Level of Development of Psychophysiological Characteristics</i>				
	<i>Very Low</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>Very High</i>
Ocular motor reaction time, ms	>340	340–330	330–320	320–310	<310
Complex ocular motor reaction, ms	>410	410–400	400–390	390–380	<380
Differentiation of muscle strain:					
small, g			90.0–92.5	92.5–95.0	
large, kg			4.25–4.50		
M-response threshold:					
M ₁	>10		10	<10	
M ₂	>20		20	<15	
Orientation in space, error degree	>6		6–4	<4	

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