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## **THE SPECIFICS OF WOMEN'S ARM WRESTLING CLASSES TAKING INTO ACCOUNT THE BIOLOGICAL CHARACTERISTICS OF THE BODY**

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ORIGINAL SCIENTIFIC ARTICLE

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**Abstract:** *To identify the features of the training process in arm wrestling and its changes during the ovarian-menstrual cycle (OMC), a survey of women was conducted. The respondents (30 athletes) are participants of the Russian Championship. The experience of arm wrestling athletes ranged 5-19 years. The results of the study indicate that the content and direction of strength training of a number of athletes are influenced by changes in the hormonal state during the ovarian-menstrual cycle (OMC). 47% of respondents take into account the phase of the OMC, doing well-being. Changes in the load relate mainly to two phases: menstrual and postmenstrual. 10% of girls cycle loads depending on certain phases. 80% of respondents reduce the load during the menstrual phase. Changes in well-being in other phases of the OMC, as a rule, are not taken into account. The main differences between women's and men's training are: 48% of respondents have less working weight of the load on free weights or simulators; 20% of participants indicated that the training does not differ from men's; 12% of girls perform leg training on a separate day. 10% of the respondents of the total number answer that their training process differs from the male one by a large amount of load, they perform exercises with less weight on shells, but the number of approaches is an order of magnitude higher; 8% of the girls replies that the training from the male differs by using stretching exercises at the end of each workout.*

**Key words:** *Arm wrestling, female athletes, ovarian-menstrual cycle, OMC phases.*

### **INTRODUCTION**

The problem of strength training of arm wrestlers seems to be very relevant in connection with the inclusion of the sport in the program of the World Universiade. Despite the growing popularity and success at the international level, arm wrestling does not yet have such a scientific base as many other types of martial arts or power sports. The bulk of publications is mainly utilitarian in nature, their content is mainly practical materials. There is not enough still clearly research reflecting the specifics of training women in arm wrestling (I.N. Nikulin at al., 2015, I.N. Nikulin at al., 2017).

The specific features of the female body are manifested in physical development, body structure, the degree of development of basic physical qualities, as well as the functioning of the nervous, endocrine and other systems. It is important to take into account the following morphofunctional features of women in the training process, which directly affect the method of strength training: the total women's muscle strength is on average 75% of this indicator for men (E.V. Filgina, 2008). At the same time, the strength of the muscles of the upper extremities of women is 43-63% less, and the lower ones - by 25-30% compared for men (D.J.H. Wilmore, D.L. Costill, 2001). Moreover, the most significant share of the difference belongs mainly to the musculature of the upper extremities, which are much stronger for men than for women.

It was found that, in general, the average muscle strength of a woman is 63.5% of the average muscle strength of a man, the isometric muscle strength of the upper body for women is 55.8% of the same indicator for men, the isometric muscle strength of the lower extremities for women is 71.9% (R.C.O. Lima at al., 2012).

Female and male organisms differ both in morphofunctional parameters and in the peculiarities of hormonal-humoral regulation. The main sex differences are related to the level of sex hormones in the blood. Biological maturation of the female body is achieved by 17-18 years, while body growth and ossification of the skeleton is completed by 19-20 years (V.G. Bershadsky, 1976).

During the ovarian-menstrual cycle of women, the level of hormones in the blood changes dramatically, this affects the excitability of women. It has been established that for most women, high excitability manifests itself in the premenstrual period or during menstruation. At the same time, a

genetically determined individual hormonal profile is determined, which affects the temperament, lifestyle and level of sexual activity. It is necessary to take into account the individual characteristics of a female athlete when planning training loads taking into account the phases of the menstrual cycle (E.V. Filgina, 2008, L.G. Shakhlina, 2001).

Research by V.L. Tatarentsev and others (2020), aimed at identifying the dependence of the strength and speed-strength abilities of arm wrestlers on the duration of the duel. In order to identify the duration of fights in women's arm wrestling, the authors analyzed 92 fights. The average duration of the women's duel was  $6.6 \pm 0.4$  sec., and the men's was  $7.1 \pm 0.5$  sec. Despite the fact that women did not significantly differ from men in terms of the time of the fight, the distributions of the results of the duration of the women's and men's duel according to the unilateral Kolmogorov-Smirnov criterion significantly differ. According to the variability of the duration of the duel, women significantly differ from men ( $p < 0.05$ ). The range of variation in women is 17 sec, in men – 23 sec. In the interval from 0 to 9 seconds, 87.9% of all results fall in women, 73.1% in men. The authors came to the conclusion that the strength training of women in arm wrestling should be more focused on the development of maximum strength of skeletal muscles, and of men – maximum strength and strength endurance.

## **MATERIALS AND METHODS**

To identify the features of the training process in arm wrestling and its changes during the ovarian-menstrual cycle (OMC), a survey and questionnaire of girls was conducted. The respondents (30 athletes) are participants of the 2017 Russian Championship. Of these, 8 people are candidates for master of sports, 13 people are masters of sports of Russia, one athlete is a master of sports of Russia of international class and 5 girls are Honored Masters of Sports of Russia. The experience of arm wrestling athletes ranged from 5 to 19 years.

## **RESULTS AND DISCUSSION**

To the question "What exercises do men usually do but you don't?", 15% of girls-respondents answered - "Bench press", 10% girls indicated flexion-extension of the arms in the emphasis on the bars, 5% of participants - "Pull-ups on one hand", 10% - "Deadlift" and 10% girls noted other options. The remaining 50% of athletes answered that they perform absolutely all exercises, just like men.

Of the first half of the respondents who do not perform all the exercises characteristic of men, to the question "Why?" the following answers were received: "They do not consider it necessary" - 50%, "They do not want" - 20%, "They cannot" - 20%, and 10% of respondents indicated that "They do not like it, it is traumatic." The answers are in no way related to the qualifications of athletes, for example, the bench press does not perform and does not consider this exercise necessary, both candidates for masters of sports and Honored Masters of Sports.

To the question: "What is the difference between your training and men's?" 48% of respondents answered that they have less working weight of the load on free weights or simulators; 20% of participants indicated that the training does not differ from men's; 12% of girls focused on training their legs on a separate day, as well as performing special and competitive exercises. Of the total number, 10% of respondents answered that their training process differs from the male one by a large amount of load, that is, they perform exercises with less weight on shells, but the number of approaches is an order of magnitude higher; 8% of girls answered that their training differs from the men's one by using stretching exercises at the end of each workout.

To the question "Do you train during the menstrual phase", 27 out of 30 women answered "Yes", 2 - "No" and only one athlete answered "except for the first day". 47% of athletes take into account the peculiarities of the monthly cycle in training, 50% do not take into account, 3% indicated minor changes in the training process. At the same time, 60% of women athletes build the training process in different phases of the OMC according to their well-being, 10% of women cycle loads depending on certain phases. 80% of respondents reduce the load during the menstrual phase. 5% of these noticed that only the intensity decreases, and 5% reduce only the volume. In 10% of the respondents, the training process

proceeds without changes and taking into account the menstrual phase, 5% of women note an increase in intensity and load during this phase and 5% do not train at all.

During the 2nd phase (postmenstrual) the intensity and load of trainings increase in 85% of women athletes, the training process remains unchanged in 10% of athletes, 6% of respondents noted a decrease in intensity and load, and 4% train in the postmenstrual phase depending on the nearest date of the competition.

## CONCLUSION

The results of the study indicate that the content and direction of strength training of a number of athletes are influenced by changes in the hormonal state during the ovarian-menstrual cycle (OMC). 47% of respondents take into account the phase of the OMC, doing well-being. Changes in the load relate mainly to two phases: menstrual and postmenstrual. Changes in well-being in other phases of the OMC as a rule are not taken into account.

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## СПЕЦИФИЧНОСТ ЗАНИМАЊА ЖЕНА ХРВАЊЕМ РУКУ С ОБЗИРОМ НА БИОЛОШКЕ КАРАКТЕРИСТИКЕ ТЕЛА

**Nikulin Igor, Sobyenin Fedor, Bogacheva Elizaveta**

**Сажетак:** *Да би се идентификовале карактеристике процеса тренинга у хрвању руку и његове промене током оварио-менструалног циклуса (ОМЦ), спроведено је испитивање за девојчице. Испитаници (30 спортиста) - учеснице руског првенства. Искусство рвања спортиста било је у распону од пет до 19 година. Резултати спроведене студије указују на то да на садржај и фокус тренинга снаге одређеног броја спортиста утичу промене у хормоналном стању у процесу оваријално-менструалног циклуса (ОМЦ). 47% испитаника узима у обзир фазност ОМЦ-а, бавећи се веллнессом. 47% испитаника узима у обзир фазност ОМЦ-а, бавећи се веллнессом. Промене оптерећења односе се углавном на две фазе: менструалну и постменструалну. 10% девојака циклизује оптерећења у зависности од одређених фаза. Смањите оптерећење током менструалне фазе 80 % испитаника. Промене благостања у другим фазама ОМЦ-а углавном се не узимају у обзир. Главне разлике у тренингу жена и мушкараца су: 48% испитаника има мању радну тежину тежине на слободним теговима или тренерима; 20% учесника је навело да се тренинг од мушкараца не разликује; 12% девојака обавља тренинг ногу на посебан дан. Од укупног броја, 10% испитаника је одговорило да се њихов процес тренинга разликује од мушког, са већим обимом оптерећења, изводе вежбе са мањом тежином на пројектиlima, али број сетова је за ред величине већи; 8% девојака је одговорило да се тренинг од мушког разликује употребом вежби истезања на крају сваког тренинга.*

**Кључне речи:** *Хрвање руку, спортисткиње, менструални циклус јајника, ОМЦ фазе.*

## SAGLEDAVANJE I ANALIZA PRAVILA I TEHNIČKO-TAKTIČKIH ASPEKATA IGRE MINI RUKOMETA

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**Sažetak:** *Fizičko vežbanje i razvoj opšte motorike dece od najmlađih dana jedan je od glavnih preduslova njihovog pravilnog razvoja. Mini rukomet je igra nastala kao modifikacija dvoranskog rukometa, sa ciljem razvoja opštih antropoloških karakteristika dece. Filozofija igre se ogleda pre svega na pravilnom razvoju i socijalizaciji učesnika, dok je rezultatski primat manje izražen. Mini rukomet je po preporukama pravila Međunarodne rukometne federacije, kao i pravilima koje definišu nacionalni savezi uglavnom predviđen za decu od 5-6 do 8-9 godina. Međutim, iako su preporuke pravila fleksibilne i u prvi plan stavljaju očuvanje i razvoj fizičkog i mentalnog zdravlja deteta, postoji još prostora za napredak. Cilj ovog rada je sagledavanje aktuelnih preporuka pravila, tehničko-taktičkih (TE-TA) i drugih aspekata igre mini rukometa od strane različitih autora.*

**Cljučne reči:** *mini rukomet, mladi, razvoj, pravila, TE-TA*

### UVOD

U 21. veku potrošnja kalorija je sve manja zbog novih izuma i otkrića koja svakodnevno pomažu čoveku da brže i lakše obavlja svoje svakodnevne poslove (Đorđić, 2006). Implikacije tzv. "nezaraznih bolesti", među kojima su dijabetes, gojaznost, posturalni poremećaji, bivaju sve veće ukoliko se nešto ne preduzme, pogotovu u predškolskom uzrastu koji predstavlja početnu fazu ubrzanog razvoja deteta (Đorđić, 2006). Postepeno sticanje veština koje se tiču i mentalnih i motoričkih aktivnosti definišu se kao psihomotorni ili senzitivni razvoj (Timmons, et al, 2007).

Predškolski i školski uzrast reprezentuju izuzetno senzitivno razdoblje za razvoj motorike dece, naročito kada je reč o učenju i usvajanju obimnog dijapazona motoričkih veština. Ukoliko u tom periodu dođe do propusta, kasnije se ne može nadoknaditi sa visokim stepenom efikasnosti (Hamza, 1999). Prema Lubans et al. (2010) i Cools et al. (2009) kretanje i igra predstavljaju ključni faktor u razvoju fizičkih, kognitivnih i socijalnih veština deteta. Važnost igre je ogromna u psihofizičkom razvoju dece. Igru dete zadovoljava svoju prirodnu potrebu za kretanjem i tako razvija motoričke sposobnosti i energetske kapacitete (Foretić & Rogulj, 2006). Garcia (2010) tvrdi da je kod svakog deteta neophodno maksimalno razvijati biološke, psihološke i socijalizacijske kapacitete, što se najefikasnije postiže uz pomoć timske sportske igre.

Mini rukomet je igra koja je nastala kao modifikacija modernog rukometa i koja ima za cilj razvoj opštih antropoloških karakteristika dece. Sama filozofija igre ogleda se pre svega u pravilnom razvoju i socijalizaciji učesnika, dok je rezultatski primat manje izražen. Mini rukomet se može posmatrati u funkciji integralnog pristupa treniranju, jer se temelji na brzini, agilnosti, snazi, preciznosti, izdržljivosti, koordinaciji. Sve navedene sposobnosti imaju svoje optimalne senzitivnim faze koje predstavljaju najbolje vreme za njihov razvoj (Bompa & Pleić, 2000).

Kako bi primarni antropološki zadaci igre mini rukometa bili ostvareni, mnogi autori su tokom godina ponudili različite predloge setova pravila, kao i tehničko-taktičkih aspekata igre, u želji da njihovom implementacijom odgovore na glavne zadatke igre. Cilj ovog rada je sagledavanje aktuelnih preporuka pravila, tehničko-taktičkih (TE-TA) i drugih aspekata igre mini rukometa od strane različitih autora.

### METODE

U oblasti mini rukometa i razvoja dece kroz praktičnu implementaciju sagledana je dostupna stručna i naučna literatura. Za prikupljanje, klasifikaciju i analizu ciljanih istraživanja korišćena je deskriptivna metoda i teorija analiza. Dostupna stručna i naučna literatura je prikupljena korišćenjem opštih i specijalizovanih internet pretraživača i baza naučnih i stručnih radova, poput Google-a, Google Scholar-