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DETERMINING THE SPEED AND STRENGTH OF 14-15 YEAR OLD HANDBALL PLAYERS IN JUMPING

Abdueva Sitorabonu Savriddin qizi*

*Teacher of the Department of Interfaculty,
Faculty of Physical Culture,
Physical Culture and Sports, Bukhara State University,
UZBEKISTAN
Email id: sitorabonu.savriddinovna93@mail.ru

ABSTRACT

High-speed and power readiness is the major factor determining the high level of the special working capacity, influencing on the efficiency of the game actions at the strongest young handball players. Jumps, along with fast run, make the main content of motor activity of the young athletes. In the main experiment made among the contingent of the young handball players aged 14-15 years the problem have been solved covering the scientific reasonable design of the motor tasks modeling the competitive hopping activity for the young handball players and providing the exact reproduction of the volume of basic effort under the certain quantitative parameters of the training load.

KEYWORDS: *Youthful Sport, Young Men And Girls Aged 14-15 Years, Handball, High-Speed And Power Preparation, Hopping Tasks, Jumping Upside Down, Jumps In Depth, Multipurpose Musclelab 2040e System, Power Of Basic Effort, Jump Height, Time Of Contact With Support, Flight Time Within Jump, Design, Motor Tasks.*

INTRODUCTION

The high level of special working capacity and the effectiveness of playing actions among the strongest young handball players are largely determined by speed-strength readiness [6]. Many authors, studying the nature of competitive activity in youth handball, note that multiple jumps in combination with running constitute the main content of the motor activity of young athletes. Jumping, along with fast running, become an effective method of attack and defense, and their number in competitive activity with age and qualification is steadily increasing both in absolute and relative indicators [5].

It was revealed that the greatest number of running jumps are made by the attackers; In the game, more jumps are performed from a standing position than from a running start, as well as jumps from two legs than from one leg, and the greatest playing efficiency was revealed in techniques with take-off in jumps with maximum height and minimum execution time. It was established that young handball players of 14 years old make 82 ÷ 87 jumps during the game, 15 years old - 100 ÷ 117 jumps per game, 16 years old - 135 ÷ 157 jumps, 17 years old - 153 ÷ 167 jumps. In terms of net playing time (for one minute of the game), these values are, respectively, at 14 years old - 3.5 jumps, 15 years old - 3.7 jumps, 16 years old - 3.8 and at 17 years old - 4.0 jump per minute for each player. It was noted that the centers make 3.3 ± 0.18 jumps per minute, forwards - 3.5 ± 0.13 jumps, defenders - 3.7 ± 0.15. The specificity of handball players' game actions is manifested in the fact that athletes perform jumping movements in various technical options (to the maximum height or speed, deviation of the body or turn, with a pause or hovering, etc.), when most of them are performed with the ball in direct contact with the enemy. Long-term playing load manifests itself in increasing fatigue, when handball players spend more effort for a lower jump height. At the same time, as handball players participate in the game, the absolute jump height significantly decreases by 5 cm after 10 minutes of the game, both in the first and second halves. It should be recognized that jumping movements are an important element of individual attacking and defensive actions of handball players.

Thus, the analysis of scientific research shows that the growth of sportsmanship against the background of improving the basic aspects of the athlete's motor skills, and primarily the speed-strength readiness of handball players, should be associated with the ability to repeatedly perform various competitive jumps, which ultimately leads to more effective game activity.

However, in the existing program materials and practical recommendations, the gross mechanical build-up of training loads in jumping exercises is preserved. Recommended loads of speed-power orientation among young handball players are not related to the nature of the jumping activity of young athletes. And, most importantly, the quantitative indicators of loads in jumping tasks do not take into account the peculiarity and specificity of the functional stresses of the musculoskeletal system of handball players of different roles. Thus, one of the prerequisites for young handball players to achieve a high level of readiness is the development and implementation of motor tasks in the training process, aimed at the upbringing of speed-strength abilities and special jumping endurance [4, 5, 6].

RESEARCH METHODS AND RESULTS

All studies were carried out in the research laboratory of the Voronezh State Institute of Physical Culture using the multifunctional system MuscleLab 2040e [13].

This system provides information on the basic kinematic and dynamic characteristics of jumping exercises. The MuscleLab software provides for the calculation of the following parameters: the duration of the jump tests in seconds, the number of jumps, the average power of the jumps, the average height of the jumps, the rigidity of the locomotor system of the lower extremities.

In the ascertaining experiment, the determination of anaerobic power indices was carried out using the Rebound Jump test - repeated jumps, and the determination of jumping endurance - using the Series Jump SJ tests - serial jumps. The study used a modified Bosco test, the essence of which is to perform a series of jumps for 60 seconds. Subsequently, the index of speed-strength endurance was calculated (Bosco S., 1999), presented as "the ratio of the average height in the last three jumps to the average height in the first three jumps", the body length was taken into account. Index indicators less than 80 ÷ 90%, indicate a low level of development of speed-strength endurance, indicators of 100% and above are high.

Table Jumping parameters in the "Repeated jumps" test ($\bar{X} \pm \delta$)

Number of jumps, units	Average jump height,cm	Average power jumps, W / kg	Stiffness of the motor apparatus
94,8±6,4	19,0±3,6	24,3±4,8	81,1±14,8
99.0	21.1	30.4	105.4
Note: The bottom column shows the data of the best attempts in testing.			

It can be seen from Table 1 that an average of 94.8 ± 6.4 jumps are made in 60 seconds, an average jump height of 19.0 ± 3.6 cm, and an average power of 24.3 ± 4.8 W /. kg. The speed-endurance index was 82% for semi-center players, 97% for center players, 78% for line players, and 75% for corner players, which to a certain extent affected young athletes. characterizes its resistance to jumping.

To reveal the dynamics of jump endurance, a change in jump height was observed in a series of exercises lasting 60 s over a 15-second interval. The dynamics of the players 'jump heights had a different configuration; the tendencies of the player's ability to jump were identified among the tasks performed by the player in the game (Figure 1).

Jump height

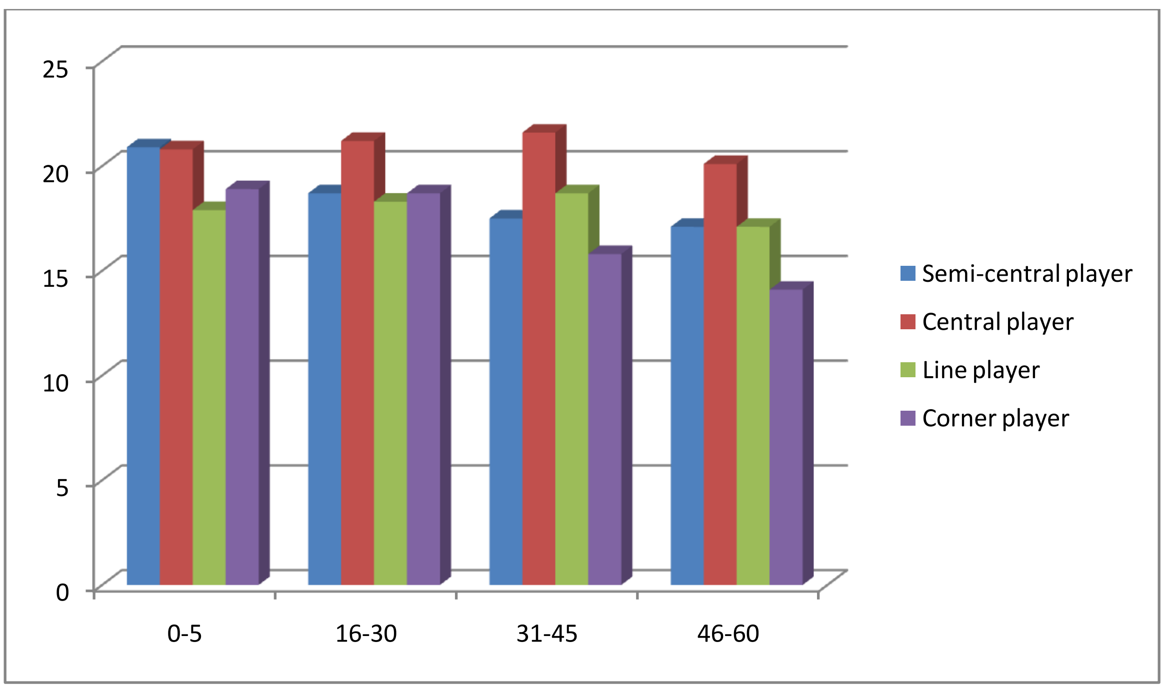

Figure: 1. Indicators of the average height of the jump in 15-second time intervals

The semi-central players showed a downward trend in their jump performance, resulting in a gradual decrease in jump height over a 15-second time interval in the “successive jumps” test. Tests for central players revealed a tendency to increase the jump height from one time interval

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to another, which showed that the players had a high endurance of speed and force. In the 60-second test, the line player's jump height varied to a non-maximum level and had a tendency to rise like corner players.

In the main experiment conducted in the contingent of young handball players aged 14-15, the problem of scientifically based design of motor tasks that simulates the competitive jumping activity of young handball players and provides accurate repetition of the value of support movements with certain quantitative parameters of training load is solved. done. As a result, studies have shown that an increase in the volume of exercise to increase speed at the age of 14-15 years has a beneficial effect on the functional state of the nervous and muscular apparatus of adolescents, develops the ability to jump.

Figure 1 Depth jumping test rates in young handball players 14-15 years old ($\bar{X} \pm \delta$)

Jumping height (cm)	Age	Height jumping out (cm)	Jump duration (ms)	Flight time	Power repulsion (watt / kg)
Young men (n_{14}=14; n_{15}=13)					
35	14	38,9±5,2	358,7±50,6	560,3±57,5	36,1±7,3
	15	39,9±9,2	314,1±105,1	566,3±67,8	43,4 ±13,2
50	14	36,9±5,0	330,9±54,1	546,8±37,	8 33,6±6,6
	15	42,2±6,1	317,3±67,6	584,9±43,9	39,9±8,9
60	14	37,4±7,5	351,2±53,6	549,4±55,7	30,7±5,5
	15	39,7± 7,3	341,6±61,9	566,8±52,1	34,0±8,1
Girls (n_{14}=12; n_{15}=15)					
30	14	29,1±4,2	251,4±56,2	484,6±57,4	32,5±7,2
	15	33,6±5,0	254,3±53,6	522,3±56,5	39,0±5,6
40	14	26,7±6,1	299,1±62,6	464,4±48,8	26,7±6,8
	15	32,4±4,6	237,3±58,1	510,7±39,6	37,1±6,6

The technology of programming the load in the training tasks of a jumping nature provided for the use of the mathematical apparatus of the theory of planning extreme experiments. It should be noted that the role of individual components in jumping tasks to achieve optimal take-off power comparable to competitive jumps is not identical, the selected exercises differ in the degree of functional impact on the speed-strength abilities of young handball players of different roles.

Figure 2

The maximum individual test scores in the depth jump young handball players 14-15 years old ($\bar{X} \pm \delta$)

Jumping height (cm)	Age	Height jumping out (cm)	Jump duration (ms)	Flight time	Power repulsion (watt / kg)
Young men					
35	14	57.6	441	685	48.0
	15	52.2	261	652	61.0

50	14	43.0	326	592	42.3
	15	49.2	322	633	44.9
60	14	47.8	393	624	36.7
	15	52.2	303	652	47.8
Girls					
30	14	35.7	306.1	539.3	37.2
	15	40.1	196.1	572.3	58.1
40	14	36.2	303.3	543.1	35.6
	15	42.0	249.4	585.2	47.6

An analysis of the results of mathematical data processing showed that the increase in the number of repetitions in jumping exercises used in the speed-strength training methodology of 14-year-old young midfielders makes jump training endurance more appropriate. The number of repetitions in motor functions is also more important than the factors of intensity (altitude, distance), which can be estimated by regression coefficients for the factors in the given mathematical equations, as well as at higher values of support force than at rest intervals. has As the jump height increases, the jump strength parameters gradually decrease.

Figure 3.

The regression equation for the repulsive power in individual jumping tasks among 14-year-old young defenders and the nature of the influence of the influencing variable factors

Type of motor task	Regression equation
Jumping off the dais	$R= 37.6 + 16.4x1 + 8.6x_3$
Jumping over hurdles	$R = 32 + 9.3x_1$
Throw in a jump after jumping-jumping	$R = 26.5 + 9x_1$
Jumps up by pushing off two, hands up	$R = 20.4 + 11.9x_1 + 6.4x_3$
Catching and passing the ball in a jump in pairs in place	$R = 18.5 + 9.5x_1 + 15.5x_1 \ x_2$
Jump upwards by pushing off two after moving in a defensive stance	$R=18,5+11x_1+9,5\ x_1\ x_2$

So, when analyzing the manifestations of the power of efforts in jumps and exercises of a jumping character, characteristic of the specifics of the game activity of defenders, it was revealed that the greatest value of the power of the supporting effort is observed in the exercise "jumping from a dais". The parameters of the load that cause the proper, comparable to the competitive, functional tension of the musculoskeletal system in this training task are the following: the number of jumps 35 times, the height of the elevation 35 cm, the rest intervals 20 s. These data were obtained by methods of mathematical analysis of "steep ascent along the response surface". It was found that among the attackers, among the influencing variable factors of the motor task, the intensity of the exercises fulfillment acquires the greatest importance (table 4).

It is characteristic that in most of the studied exercises the parameters of the support force power are determined by the elevation height. In general, we would like to note that exercises of a striking character in jumps acquire a significant value in improving the speed-strength abilities of

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young athletes. The optimal parameters of the load in the training task "jumping from a dais" for attackers of 14 years old are 25 jumps performed from a pedestal 50 cm high, with a rest interval of 15 seconds.

Table 4 The regression equation of the repulsive power in individual jumping tasks in young attackers of 14 years old and the nature of the influence of the influencing variable factors

Type of motor task	Regression equation
Jumping off the dais	$R = 43.6 + 11.9x_2$
Jumping over hurdles	$R = 38.4 + 18.6x_2$
Throw in a jump after jumping-jumping from a dais	$R = 28.0 + 11.5x_2$
Jump by pushing off one from two steps after the take-off run with reaching the highest mark on the gate	$R= 29.3 + 9.3x_1\ x_2$
Leap in place by pushing off two with reaching the mark on the goal	$R = 27.0 + 10.3x_2$
Throw in a jump in various technical variations with a change in distance hitting the target	$R = 25.8 + 10.3\ x_1\ x_2$
Jumps up by pushing off two, hands up.	$R= 17.1 + 7.3x_1 + 11.5x_3$

The specificity of the functional stresses of the musculoskeletal system of the center players of 14 years old is associated with multiple repetitions of jumps of a different nature in motion and on the spot, while the greatest power of the support force among the center players was found in the group of jumping exercises performed in motion. The leading factors influencing the manifestation of power in jumps in motion are the number of jumps, as well as the number of series with constant rest intervals of 35 seconds. In the center, the display of the power of the support force is activated with an increase in the number of jumps not only in one move, but also an increase in the number series.

Table 5 The regression equation for the repulsive power in individual jumping tasks in young center 14 years old and the nature of the influence of influencing variable factors

Type of motor task	Regression equation
Stream jumps upward by pushing off one after a run in 2.4 steps	$R = 25.1 + 13.9x_1 + 8.9x_4$
Multiple jumps from foot to foot over 10 push-offs	$R= 26.0 + 8.5x_1 + 13.3x_4$
Jump by pushing off two after the run with reaching the highest mark on the gate	$R = 33.2 + 9.5x_1$
Leap in place by pushing off two with reaching the mark on the goal	$R= 24.4 + 11.6x_1$
Jumps up and forward by pushing off two on "cut legs", hands above	$R= 19.5 + 8x_1 + 16.3x_4$
Jumps up by pushing off two, hands up	$R= 18.3 + 10.3x_1 + 9.3x_4$
Stream jumps (three) in place by pushing off two with reaching the mark on the goal, hands on top	$R = 18.0 + 11x_1$
Jumping with a ball on the backboard or against the wall	$R = 17.4 + 6.6x_1 + 11.4x_4$
Note: x_1 - number of repetitions, x_2 - intensity (height, distance), x_3 - rest intervals, x_4 - number of series.	

CONCLUSIONS

If we take into account that the training task is the initial element of the training micro-structure, then it can be argued that the quality and effectiveness of the training process largely depends on the choice and construction of the most optimal training tasks corresponding to the load of the competitive exercise [4,5,6].

Scientifically grounded construction of training tasks in the structure of a separate lesson and a micro cycle will lead to the implementation of purposeful and effective management of the current state of an athlete, and in the complex both physical and sports-technical readiness [9].

REFERENCES

1. Azimovna Fatullayeva Muazzam, Ashrapovich Narzullayev Farrux. Motivation of students to do sports as part of physical education classes ACADEMICIA: An International Multidisciplinary Research Journal. Year : 2020, Volume : 10, Issue: P: 1446-1450. Online ISSN : 2249-7137. Article DOI : 10.5958/2249-7137.2020.00344.4
2. Kadirov Shokhrukh Nematovich, Abduyeva Sitorabonu Savriddin kizi, Fatullayeva Muazzam Azimovna, Kurbanov Shukhrat Kuldoshevich. USING OF INNOVATION TERMS IN PHYSICAL EDUCATION AND SPORT LESSONS AND THEIR SOCIAL AND EDUCATIONAL FEATURES. Journal of Critical Reviews. doi: 10.31838/jcr.07.06.84. 2020; 7(6): 470-471.
3. Kasimova Zebo Khamidovna. Application of interactive methods in teaching psychology. Academicia: An International Multidisciplinary Research Journal https://saarj.com. Year : 2020, Volume : 10, Issue: 9 P. 197-205. Article DOI : 10.5958/2249-7137.2020.01046.0
4. Mirzayeva Sayyora Rustamovna. Psychological features of attitudes of students to their own health in conflict situations. journal of critical reviews. ISSN- 2394-5125 VOL 7, ISSUE 17, 2020. http://www.jcreview.com/?sec=cissue.
5. Nematovich KS, Savriddin kizi, AS, Azimovna FM, Kuldoshevich KS. Using of innovation terms in physical education and sport lessons and their social and educational features. Journal of Critical Reviews 2020;7(6):470-471. doi:10.31838/jcr.07.06.84.
6. S.S.Abdueva, Sh.Khurbonov,N.Sabirova. Evolution of physical performance and techniques of handball girls aged 11-12. International Journal of Advanced Research in Science, Engineering and Technology (IJARSET). 2019 december
7. S.S.Abdueva,Sh.Kadirov,M.Fatullaeva,Sh.Khurbonov. Using of innovation terms in physical education and sport lessons and their social and educational features. Journal of Critical Reviews ISSN-2394-5125 Vol 7,Issue 6,2020
8. S.S.Abdueva. Activities that increase children's interest in the sport of handball. Innovatsionnoe razvitie nauki I obrozovanie mejdunarodnaya nauchno-prakticheskaya konferensiya 2020
9. Samarova Shoxista Rabidjanovna, Rakhmonova Muqaddas Qahramanovna, Mirzarahimova Gulnora, Ikromovna, Maratov Temur Gayrat ugli, Kamilov Bobir Sultanovich. Psychological aspects of developing creative personality and the concept of reduction of creativity to intellect. JCR. 2020; 7(17): 498-505. doi: 10.31838/jcr.07.17.69

10. SH.Kadirov. Didactic opportunities to form knowledge about healthy lifestyle to the students in physical education classes. European Journal of Research and Reflection in Educational Sciences Vol.7 No.12,2019 ISSN 2056-5852

11. SH.Kadirov.Theory and metohods of physical educattion,sports training,recreational and adaptive physical culture. I international scientific specialized conference international scientific review of the problems of pedagogy and psychology Boston.USA.April 18-19.2018

12. Абдуллаев М.Ж. Swot-анализ в структуре информационных технологий физического воспитания // Система менеджмента качества в вузе: здоровье, образованность, конкурентоспособность. Сб. науч. тр. VII Междунар. науч. - практ. конф., 2018, С. 14-18.

13. Абдуллаев М.Ж. Взаимосвязь физическоо и психического развития детей в процессе физического воспитания. // Журнал. Вестник интегративной психологии. Ярославл, 2018. №17. 10-13 б. [13.00.00№23].

14. Абдуллаев М.Ж. О некоторых особенностях кинематики метания диска с места // Система менеджмента качества в вузе: здоровье, образованность, конкурентоспособность. Сб. науч. тр. VII Междунар. науч. - практ. конф., 2018, С. 7-10.

15. Абдуллаев М.Ж. Физкультурно-оздоровительные подходы в процессе физического воспитания студентов вузов // Система менеджмента качества в вузе: здоровье, образованность, конкурентоспособность. Сб. науч. тр. VII Междунар. науч. - практ. конф., 2018, С. 10-14.

16. Воронов, А. В. Методическое пособие по работе с аппаратно-дограммными комплексами MuscleLab 4000e и 4020e / А.В. Воронов. – М. : [б. и.], 2007. – 102 с.

17. Германов, Г. Н. Проектирование тренировочных заданий в учебных программах по видам спорта для ДЮСШ, СДЮШОР, ШВСМ, УОР / Г.Н. Германов, В.Г. Никитушкин // Физическая культура: воспитание, образование, тренировка. – 2006. – № 2. – С. 8-13.

18. Германов, Г. Н. Тренировочное (двигательное) задание – структурно-функциональная единица спортивно-педагогического процесса : теоретико-методический аспект проблемы / Г.Н. Германов // Теория и практика физ. культуры. – 2011. – № 5. – С. 94-99.

19. Германов, Г. Н. Тренировочное задание как первичная единица микроструктуры спортивной тренировки / Г.Н. Германов, Е.Г. Цуканова // Ученые записки университета имени П.Ф. Лесгафта. – 2011. – № 4 (74). – С. 29-34.

20. Ибрагимов А.Х. Оценка эффективности системы раннего оповещения о сильных землетрясениях в условиях редкой сети сейсмических станций. DOI: https://doi.org/10.33408/2519-237X.2020.4-3.280 УДК 550.34.03. https://cyberleninka.ru/article/n/otsenka-effektivnosti-sistemy-rannego-opoveschemiya-o-silnyh-zemletryaseniyah-v-usloviyah-redkoy-seti-seysmicheskih-stantsiy

21. Кадиров Ш.Н. РАЗВИТИЕ ЖЕНСКОГО СПОРТА В УЗБЕКИСТАНЕ [DEVELOPMENT OF WOMEN'S SPORTS IN UZBEKISTAN] // INTERNATIONAL SCIENTIFIC REVIEW OF THE PROBLEMS OF PEDAGOGY AND PSYCHOLOGY (Boston, USA - 19 April, 2018). с. https://scientific-conference.com/h/sborniki/pedagogicheskie-nauki2/1110-development-of-women.html

ISSN: 2249-7137 Vol. 10 Issue 11, November 2020 Impact Factor: SJIF 2020 = 7.13

22. Кадиров Ш.Н. ФИЗИЧЕСКОЕ ВОСПИТАНИЕ КАК ФАКТОР УСПЕХА СТУДЕНТОВ// European research № 5 (52) / Сб. ст. по мат. «European Research: Innovation in Science, Education and Technology/Европейские научные исследования: инновации в науке, образовании и технологиях»: LII межд. науч.-практ. конф. (Лондон. Великобритания. 08 мая, 2019). С. https://internationalconference.ru/13-00-00-pedagogicheskie-nauki.html?type=atom&start=76

23. Касимова З.Х. РАЗВИТИЕ ВАЖНЫХ ПСИХОЛОГИЧЕСКИХ КАЧЕСТВ В ЛИЧНОСТИ РУКОВОДИТЕЛЯ [DEVELOPMENT OF IMPORTANT PSYCHOLOGICAL QUALITIES IN THE PERSONALITY OF THE LEADER] // LXXIV International Scientific Review of the Problems and Prospects of Modern Science and Education Свободное цитирование при указании авторства:https://scientific-conference.com/grafik/grafik-2020-pervoe-polugodie.html (**Boston. USA.** - 27 October, 2020). с. {см. сборник}

24. **Касимова З.Х.** ОСОБЕННОСТИ НАЦИОНАЛЬНЫХ ЦЕННОСТЕЙ И МЕЖКУЛЬТУРНЫХ КОММУНИКАЦИЙ В СОДЕРЖАНИИ ГУМАНИТАРНОГО ОБРАЗОВАНИЯ // Вестник науки и образования №22(76), 2019. URL:http://scientificjournal.ru/images/PDF/2019/VNO-76/osobennosti-natsionalnykh_1.pdf