

## **INFLUENCE OF STRENGTH-BUILDING ACTIVITIES ON RESULTS IN COMPETITIONS OF SPORTSMEN IN WORKOUT**

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### *Annotation*

**Malyarenko I.V., Romaskevich Yu.O., Koltsova O.S., Yuskiv K.V.**  
**Influence of strength-building activities on results in competitions of sportsmen in workout.** Relevance of investigation is caused by regularities of origin and development of Workout as one of directions of strength gymnastics, in which to achieve results the important role is played by the level of development of strength properties. Analysis of the up-to-date studies of Workout development points to the need to draw attention to some features in the organization and methods of carrying out training spells. Only taking in consideration all factors and rational building of the structure of training process, a necessary physical preparation and high sports results can be achieved. *The purpose of investigation* – to develop a method of strength training in Workout and to check it up in competition activities. *Results of investigation.* A modern trend of strength-building acrobatics “Street workout” appeared as the variety of bodybuilding and is based on gymnastic exercises. Workout — English-American term is translated as “training” and composed of the complex of physical exercises directed to the improvement of strength, strength endurance and body shape. Proceeding from this, exercises in speed-and-strength moves and methods of static and isometric exercises are used in special training. Trainings that are carried out in different regimens and give weighty results are rightly considered as special methods of development of strength, in which it is necessary to diversify a regulation of stress in different regimen of their work: isometric, concentric, excentric. In the paper, it was determined that the most

effective ways and methods of strength development in Workout are varieties of exercises “Finger-tip push-up” (press-ups), method of isometric and static tensions, Tabat’s protocol. The analysis of our own experimental findings has given the base to determine that developed procedure of strength training of sportsmen-workouters gives the most significant increase of results in control exercises “Horizontal backward hang”, “Muscle-up on horizontal bar”, “Push-ups from the floor” and “Arm balance”. In the process of investigation, a direct correlation between a strength preparedness and results of competitions in the exercise “Chest Dips with additional weight”; strength preparedness and the final results of competitions in Workout was established. The obtained data are confirmed by the results of sportsmen’s participation in regional competitions in Street Workout.

**Key words:** workout, strength, competitions, isometric exercises, push-ups, Tabat’s protocol.

**Маляренко І.В., Ромаскевич Ю.О., Кольцова О.С., Юськів К.В.**  
**Вплив силової підготовки на змагальний результат спортсменів у Workout.**  
Актуальність дослідження зумовлена закономірностями виникнення та розвитку Workout як одного з напрямів силової гімнастики, в якому для досягнення результатів важливу роль відіграє рівень розвитку силових якостей. Аналіз передових досліджень з розвитку Workout вказує на необхідність звернути увагу на особливості організації та методики проведення тренувальних занять. Тільки з урахування всіх факторів та раціональної побудови структури тренувального процесу можна досягти необхідної фізичної підготовки та високих спортивних результатів. *Мета дослідження* - розробити методику силової підготовки у Workout та перевірити її ефективність в змагальній діяльності. *Результати дослідження.* Сучасний напрям силової акробатики «Street workout» виник як різновид атлетичної гімнастики і базується на гімнастичних вправах. Workout — англо-американський термін, перекладається як «тренування» і складається із комплексу фізичних вправ, спрямованих на вдосконалення сили, силової витривалості і форми тіла. Виходячи з цього, у спеціальній підготовці використовують вправи у

швидкісно-силових рухах та методи статичних і ізометричних вправ. Тренування, що проводяться в різних режимах і дають вагомі результати, правомірно вважати спеціальними методами розвитку сили, в яких необхідно урізноманітнювати регуляцію напруги в різних режимах їхньої роботи: ізометричному, концентричному, ексцентричному. У статті зазначено, що найбільш ефективними засобами та методами розвитку сили у Workout є різновиди вправи «Згинання та розгинання рук в упорі лежачи» (віджимання), метод ізометричних та статичних напруг, протокол Табата. Аналіз власних експериментальних даних дав підставу визначити, що розроблена методика силової підготовки спортсменів-воркаутців дає найбільш значимі прирости результату у контрольних вправах «Горизонтальний вис ззаду», «Підйом силою на поперечені», «Віджимання від підлоги» та «Стійка на руках». В процесі дослідження встановлено прямий кореляційний зв'язок між силовою підготовленістю та результатами змагань у вправі «Віджимання на брусах з додатковою вагою»; силовою підготовленістю та підсумковими результатами змагань з Workout. Отримані дані підтверджуються результатами виступів спортсменів на обласних змаганнях по Street Workout.

**Ключові слова:** воркаут, сила, змагання, ізометричні вправи, віджимання, протокол Табата.

**Маляренко И.В., Ромаскевич Ю.А., Кольцова О.С., Юськив Е.В.**  
**Влияние силовой подготовки на соревновательный результат спортсменов в Workout.** Актуальность исследования обусловлена закономерностями возникновения и развития Workout как одного из направлений силовой гимнастики, в котором для достижения результатов важную роль играет уровень развития силовых качеств. Анализ передовых исследований по развитию Workout указывает на необходимость обратить внимание на особенности организации и методики проведения тренировочных занятий. Только с учетом всех факторов и рационального построения структуры тренировочного процесса можно достичь необходимой физической подготовки и высоких спортивных результатов. *Цель исследования* - разработать методику

силовой подготовки в Workout и проверить ее эффективность в соревновательной деятельности. **Результаты исследования.** Современное направление силовой акробатики «Street workout» возник как разновидность атлетической гимнастики и базируется на гимнастических упражнениях. Workout - англо-американский термин, переводится как «тренировка» и состоит из комплекса физических упражнений, направленных на совершенствование силы, силовой выносливости и формы тела. Исходя из этого, в специальной подготовке используют упражнения в скоростно-силовых движениях и методы статических и изометрических упражнений. Тренировки, проводимые в различных режимах и дают весомые результаты, правомерно считать специальными методами развития силы, в которых необходимо разнообразить регуляцию напряжения в различных режимах их работы: изометрическом, концентрическом, эксцентричном. В статье указано, что наиболее эффективными средствами и методами развития силы в Workout есть разновидности упражнения «Сгибание и разгибание рук в упоре лежа» (отжимание), метод изометрических и статических напряжений, протокол Табата. Анализ собственных экспериментальных данных дал основание определить, что разработанная методика силовой подготовки спортсменов-воркаутцев дает наиболее значимые приросты результата в контрольных упражнениях «Горизонтальный вис сзади», «Подъем силой на перекладине», «Отжимания от пола» и «Стойка на руках». В процессе исследования установлено прямая корреляционная связь между силовой подготовленностью и результатами соревнований в упражнении «Отжимания на брусьях с дополнительным весом»; силовой подготовленностью и итоговым результатом соревнований по Workout. Полученные данные подтверждаются результатами выступлений спортсменов на областных соревнованиях по Street Workout.

**Ключевые слова:** воркаут, сила, соревнования, изометрические упражнения, отжимания, протокол Табата.

**Introduction.** Modern realities of technogenic environment cause the acute need in renovation of physical and spiritual strength that a human being loses in the

process of labor activities and everyday communication. Recreation as the activity is directed to a realization of the needs in renovation and development of physical and spiritual strength of man, his intellectual perfection.

A contradiction in the system of values in modern socio-cultural situation leads to the fact that young people lose the ability to withstand the influence of negative tendencies that have already formed in the system of youth permissibility. In this connection, it seems particularly timely to study new needs and values that are being formed in the space of permissibility and its separate types, to determine the role and place of permissibility in the life of modern youth.

Actualization of problems of youth permissibility is caused by the fact that young generation in accordance with its socio-cultural needs, its spare time devotes, mostly, to communication in young companies, groups of equals in age, where a peculiar young sub-culture is being formed that has its own impact on the formation of human young personality.

A. Abdulkarimov, C. Guskov, O. Kirilenko, A. Rodionov et al., state that the most important function of sport is health-improvement and recreation-cultural. Urgent is the problem to engage our youth in sport as the most effective way to change alarming tendency of decreasing the level of motor activity and health, because to-day in Ukraine only 5-8% of children finish a secondary school without problems in the state of health.

Sport includes in itself various social forms. It exists as a certain activity connected with body practices; and as a game that is coordinated by rules; and as entertaining show; and as a variety of professional human activities.

*Strength gymnastics* – Workout proposes a complex of physical exercises, directed to the improvement of strength, endurance and body shape. In addition, it is based on physical exercises, gymnastics, strength exercises and acrobatics and therefore it is like a spectacular display. The up-to-date workout propagandizes a healthy way of life, struggle with narcomania, alcoholism, smoking, computer dependence, etc. As the alternative to the above listed, the youth is proposed training. From this point of view, our investigation is rather timely [3].

**Purpose of investigation** – to develop a method of strength training in Workout and to check up its effectiveness in the competitions.

**Material and methods of investigation.** Investigation was carried out with sportsmen that are engaged in Workout, aged 15-17 years, with a total number of 13 participants. A pedagogical experiment lasted from 2015 to 2017. In the course of investigation, the following methods were used: *theoretical* - analysis of research-and-methodical literature on the problem of investigation; generalization of theoretical and empirical data; *empirical* – diagnostic (pedagogical monitoring, pedagogical experiment, method of control tests); *methods of mathematic statistics* – for interpretation and processing of the results of investigation.

**Results of investigation. Discussion.** Nowadays, quite natural is the desire of young men and girls to become strong and harmoniously developed but it can be achieved only by way of systematic physical exercises and being engaged in sport. It is due to the popularity of body-building among teenagers, young men and girls because it facilitates harmonious development of the whole body, proportions and musculature, formation of proper posture, strength and agility, flexibility and other physical and moral-volitional properties.

L. Eiunz defines a “body-building” as the system of exercises with regulated support directed to comprehensive physical training and formation of outward body shape; strengthening of joints, tendons and ligaments; increase of functional abilities of people who are engaged in recreation exercises, etc [1].

L. Dvorkin, L. Eiunz and other note that in athletic sports there are many exercises different in their motion structure, ways of performance and energy supply. They can be used to make up complexes to solve a lot of health-improvement, cultural and educational tasks. In addition, every separate exercise depending on the method of its application can be multifunctional [1, 4].

Research of scientists [2, 5] allow state that the fundamental principle of physical training is strength-building activities. One of the most important physical properties in athletic sports is strength.

As non-traditional methods of strength development are isometric exercises. A. Smirnov states that unlike the method of static training, method of isometric tensions is intended for a development of maximal strength abilities [6].

Investigators of the method of isometric tensions (A. Smirnov, I. Zakirov and V. Pluzhnick, V. Tsymbalyuk et al.) proceed from the fact that the strength is manifested according to the value of resistance: the greater is the resistance, the greater is the effort directed to overcome it. The greatest is considered the resistance that is impossible to overcome with a muscular effort. Under conditions, when a possibility of motion is excluded, a sportsman must with a strong-willed effort gradually to bring the tension to a maximal and to hold it for 5-6 sec.

A. Smirnov singles out the following advantages of isometric exercises:

- possibility to achieve a maximal muscular contraction in contrast to isotonic exercise, also known as strength training ;
- training occurs much faster; it is necessary to hold the position for each exercise from 6 to 8 seconds and to make 5 – 10 sets in the exercise.
- it is possible to increase strength values [6].

Thus, with the help of isometric exercises, one is able to work over every portion of the body with a high quality wasting a minute or so.

But in this method, there are certain shortcomings: decrease of muscular endurance, uniformity of exercise performance, increase of arterial pressure. Therefore, in the process of training sportsmen for a Workout, one should use this method only in the complex with other generally adopted methods.

On the base of the analysis of scientific-and-methodical literature, pedagogical monitoring, questioning of leading specialists, we have developed special complexes of physical exercises and the experimental procedure of development of strength properties for sportsmen engaged in Workout, including different types of push-ups; isometric exercise: “angle on the sticks with a drawn tight braid”, “airplane on the floor”, “heaving exercises with counteraction”, “Parallel bar dips with counter action”; static exercises: backward hang, front hang, horizontal with feet apart, free front balance on bent hands, bent suspension, arm balance.

Verification of effectiveness of this method was carried out during regional competitions in Workout (Kherson city, 01.06.2017).

### ***Method of strength-building activities in Workout***

Strength-building activities of workouters was carried out according to the following directions

- development of dynamic strength;
- development of static strength;
- development of strength endurance;
- development of flexibility;

In the process of development of strength properties, we have taken into account the following methodical provisions:

- presence of complex exercises of the dynamic and static nature;
- taking into account one's own strength in determination of the amount of loading in one set;
- duration of static exercises makes up 10-30 seconds, with tension that is gradually increases to a maximal;
- complex of strength exercises is included in the second part of training.

### ***Push-ups as the basic way of strength development in Workout***

In the theory and methods of sport, the problem of use of physical exercises – “stoop and stretch in prone position” (hereinafter, push-ups) is rather deeply studied by scientists L. Matveev, V. Platonov, T. Krutsevich, A. Ter-Ovanesyan et al. They note that stoop and stretch in prone position (push-ups) is the basic exercise, that is done from a facedown position, and directed to the development of human strength. They are useful for support of joints mobility and tonicity of shoulder girdle muscles (triceps, brachial and deltoid muscles), all muscles of the thorax and trunk as a whole.

In Workout, push-ups is one of the main direction of training. They are used to develop strength, endurance, rapidity, dexterity and other physical properties as well as basic elements in competitions, where their variability depends on sportsman's creative approach, understanding and level of physical training [3].



In sports training, push-ups are most often used in a preparation part during a warming-up, since it permits to warm all groups of muscles and to get the organism ready for the more heavy loads.

According to variations of push-ups, in the process of workouters' training, we distinguish the following types: basic push-ups with one's own weight; complex coordination push-ups; push-ups with additional outfitting; plyometric push-ups. In accordance with the above types, we have developed a classification of push-ups that is used in the process of workouters' strength-building activities.

1. *Basic push-ups with one's own weight* – they are generally available, basic moves that do not require auxiliary equipment or other auxiliary means while performing exercises and can be accompanied by additional change of grip and its configuration and width.

2. *Complex coordination push-ups* – directed to the development of not only strength, but rapidity as well. Push-ups are performed with a complex-coordination complication that may be an arm balance, acrobatic element as well as balance elements.

3. *Push-ups with additional outfitting* help to vary the technique of exercise performance and to increase the depth of motion. For example, the use of some objects above the floor (benches, chairs), wall, weights and auxiliary objects.

4. *Plyometric push-ups* (from English word “plyometrics”– multiply, grow) – effective exercises that include rapid, explosive muscular body moves (jumps). They include many explosive body movements that not only improve muscular coordination, but functions of nervous system as well. In order to activate different groups of muscles, hands can be placed in various positions (a wide placement of arms increases the load and engages muscles of the external part of the chest; a narrow arrangement – shifts the accent to the internal part of thoracic muscles). In push-ups, one can turn hands with fingers to the middle or outwards. Different variants of support enable to develop various groups of muscles [4,21].

***Isometric exercises that were used in the process of the workouters' strength-building activities***

*Angle on the sticks with a braid* – a braid is drawn tight between two long sticks and a sportsman performs the angle with straight arms, trying to lift legs as higher as possible.

*Airplane on the floor* – a sportsman lying in the facedown position with straight arms tries to press on the support. In so doing, the arms are a little wider than shoulders. Bring a tension to a maximum using not only the muscles of arms but dorsal muscles should also participate. Keep this posture from 5 to 10 sec. Breathing while performing this exercise is moderate. The number of sets 5-10. The period of rest is no more, than 10 sec.

*Heaving exercises with a counteraction* – a sportsman hanging on the horizontal bar performs heaving exercises, in so doing he is kept by the legs not giving him to perform the exercise completely. This exercise can also be performed with bent elbows where the angle is  $90^\circ$ .

*Parallel bar Dips with a counteraction* – a sportsman standing on bent arms in support on parallel bars, angle  $90^\circ$ , tries to straighten his elbows. In this case, a counteraction is performed with his opponent.

### ***Static exercises that were used in the process of the workouters' strength-building activities***

*Backward hang* – horizontal hang, in which the body is a horizontal backward position.

*Front hang* – horizontal hang, in which the body is in the horizontal position.

*Horizontal (feet apart)* – the trunk is in the horizontal position on straight arms.

*Horizontal support on bent arms* – the trunk is in the horizontal position on bent arms.

*Hang on bent arms* – a hang on horizontal bar on bent arms, where the angle makes up  $90^\circ$ .

*Arm balance* – a vertical position of the sportsman upside down, in which he supports himself with straight arms on the floor or gymnastic apparatus.

### ***Scheme of workouters' trainings according to Tabat's protocol***

While developing this method of training, we have used Tabat's method. Trainings in accordance with Tabat's protocol consists of three phases:

- Warming-up (5 min.) is necessary to warm up muscles and to prepare for intensive performance of exercises.

- Cycle of exercises according to Tabat's protocol – 8 sets by 20 seconds, interval for rest – 10 sec. In this regimen of work for 20 seconds of active phase, first, ATP-mechanisms of energy supply start to act and by the end of the phase glycolytic mechanisms are connected.

- Final part (2 min.) – brisk walking, gradually reducing the tempo.

According to the above mentioned, we have developed a scheme of trainings for workouters in accordance with Tabat's protocol. The basic difference of the method, we have developed, is in the fact that after every exercise, which is performed with maximal intensity for 20 sec., it needs to carry out the exercise ones more for 10 sec and as slow as possible. Thus, we develop not only a strength endurance but a slow dynamic force as well, that substantially affects the development of maximal strength. Duration of such training is 4 min (6 sets by 20 seconds of intensive performance of the exercise and by 10 seconds of slow performance of each exercise).

Under the effectiveness of the introduced method, we understand its final impact on the development physical properties of sportsmen that was verified with the help of output and final testing according to the existing methods and normative requirements.

The average obtained results of testing and changes in these indices and their increase are given in Table 1. It is noted that in the course of carrying out the first and second testing and generalization of the data received, we have used the same methods of processing and analysis of the obtained results.

As it is evident from the results given in Table 1, the greatest increase of strength was observed with the exercise "Horizontal backward hang" (65%). In the second place by the result of increase is the test "Muscle-up on horizontal bar" (25%). Rather high indices of increase were received in testing of "Push-ups from the

floor” (21.1%) and “Arm balance” (20.6%). Somewhat lower indices were received in other tests however, it is worthy to note that changes in the results were also positive.

*Table 1.*

**Results of investigation of workouters’ strength-building activities**

| No | Test                                | I test    |       | II test   |       | Increase |       |      | P                  |
|----|-------------------------------------|-----------|-------|-----------|-------|----------|-------|------|--------------------|
|    |                                     | Result    | Score | Result    | Score | Result   | Score | %    |                    |
| 1  | Angle, sec.                         | 17±11.3   | 6.6   | 18±8.7    | 7.6   | +1       | +1    | 5.6  | P>0.05<br>t = 1.01 |
| 2  | Horizontal backward hang, sec.      | 4.27±2.51 | 1.8   | 12.2±7.1  | 5.9   | +7.93    | +4.1  | 65   | P<0.01<br>t = 3.74 |
| 3  | Horizontal feet apart, sec.         | 8.7±4.05  | 7.7   | 9.41±3.21 | 8.5   | +0.71    | +0.8  | 7.5  | P>0.05<br>t = 0.91 |
| 4  | Arm balance, sec.                   | 11.2±9.5  | 5.7±  | 14.1±9.95 | 6.1   | +2.9     | +0.4  | 20.6 | P<0.01<br>t = 3.20 |
| 5  | Horizontal front hang, sec.         | 3±1.41    | 1.4   | 3.7±1.6   | 1.8   | +0.7     | +0.4  | 9    | P<0.05<br>t = 2.51 |
| 6  | Muscle-up on horizontal bar, times. | 6±1.9     | 3.5   | 8±2.4     | 4.1   | +2       | +0.6  | 25   | P<0.01<br>t = 4.52 |
| 7  | Parallel bar dips, times.           | 34±6.88   | 6.8   | 37±5.56   | 7.5   | +3       | +0.7  | 8.1  | P<0.05<br>t = 2.69 |
| 8  | Heaving exercises, times.           | 16±3.5    | 5.5   | 18±3.55   | 6.2   | +2       | +0.7  | 11.1 | P<0.01<br>t = 3.87 |
| 9  | Pushups, times.                     | 60±8.72   | 6     | 76±10.33  | 7.6   | +16      | +1.6  | 21.1 | P<0.01<br>t = 6.35 |

For a more detailed analysis of individual results of workouters’ strength-building activities, we have used a series tests, according to which a sportsman received a final sum of scores by nine indices. Changes of workouters’ individual results in the course of pedagogical experiment are given in Table 2.

*Table 2.*

**Changes of individual results of workouters’s strength-building activities in the course of pedagogical experiment**

| Test   | Number of the beginner (by protocol) |      |      |    |      |      |      |      |      |      |      |      |      |
|--------|--------------------------------------|------|------|----|------|------|------|------|------|------|------|------|------|
|        | 1                                    | 2    | 3    | 4  | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   |
| 1 test | 64.2                                 | 32.8 | 47.6 | 38 | 33.8 | 45.5 | 50.8 | 54.9 | 56.8 | 25.4 | 50.2 | 51.6 | 48.1 |

|          |      |       |      |       |       |      |      |       |      |      |      |      |      |
|----------|------|-------|------|-------|-------|------|------|-------|------|------|------|------|------|
| 2 test   | 72.1 | 44.9  | 63.6 | 57.3  | 43.9  | 50.8 | 56.9 | 69    | 61.5 | 33.5 | 59.2 | 63.6 | 51.5 |
| Increase | +7.9 | +12.1 | +16  | +19.3 | +10.1 | +5.3 | +6.1 | +14.1 | +4.7 | +8.1 | +9   | +12  | +3.4 |

Analysis of results allowed determine the individual level of workouters' strength-building activities according to a series of tests.

After the introduction of developed method of strength-building activities, sportsmen's indices and their rating in the group, relative to the results obtained, somewhat changed that gives evidence of the effectiveness of application of developed method of strength-building activities with the use of Tabat's protocol, various push-ups, static and isometric exercises in the system of workouters' training.

With the purpose of analyzing the influence of level of strength-building activities on the result received in competitions, we have analyzed the indices of performances of sportsmen-workouters during regional competitions in Street Workout (Kherson, 01.06.2017 ).

It is noted that in the course of competitions sportsmen participated in two types of exercises freestyle and parallel bar dips with additional loads (45% of sportsman's bodyweight). For every exercise, sportsmen received a certain number of scores that were later summed up in order to determine the absolute winner of competitions. It should be pointed out that in the estimation of the exercise "Freestyle", the technique of performance of static, dynamic, complex-coordination and additional (according to sportsman's choice) exercises were taken into account. The analysis of results of competitions has shown that the winners of competitions became sportsmen from Kherson that were trained in accordance with the developed method. We should like to underline that of 13 sportsmen of the group, 10 sportsmen by the results of competitions were placed among the best ten in various forms of the program.

To determine the interrelations between the level of strength-building activities and the results of performance in competitions in Workout, a correlation analysis was carried out between these indices and significant direct relations were found out between:

- strength-building activities and results of competitions in the exercise “Chest Dips with additional weight” ( $r = 0,75$ );

- strength-building activities and final results of competitions in Workout ( $r = 0,72$ ).

The average direct relation was determined between:

- strength-building activities and results of competitions in the exercise “Freestyle” ( $r = 0,39$ ).

Summing up the results of testing, competitions and correlation analysis, we can state that this developed method can be recommended for training workouters for competitions of different level.

**Conclusions and perspectives of further investigations.** We have established that the most effective means and methods of strength development in Workout are varieties of the exercise “Bending and extension of arms in (push-ups), method of isometric and static strains, Tabat’s protocol.

Analyzing the results of strength-building activities with the use of the developed method, the most significant increases of the result we have received in control exercises “Horizontal backward hang” - 65% ( $P < 0,01$ ); “Muscle-up on horizontal bar” - 25% ( $P < 0,01$ ); “Push-ups from the floor” - 21,1% ( $P < 0,05$ ) and ”Arm balance” - 20,6% of previous result ( $P < 0,01$ ).

In the process of investigation, a direct correlation between strength-building activities and the results of competitions in the exercise “Chest Dips with additional weight”; strength-building activities and final results of competitions in Workout was established.

Perspectives of further investigations are in the determination of most weighty component of strength-building training with the purpose of further improvement of the Workout sports training system.

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