Coordination ladder as a modern means of online training to improve the physical fitness of female gymnasts 8-9 years old

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Purpose: to determine the effectiveness of the developed methodology using special exercises on the coordination ladder to increase the level of physical fitness of female gymnasts 8-9 years old during online training.

Material, participants and methods: 24 female athletes aged 8-9 years old, who are engaged in artistic gymnastics in the basic training group of the first year of study, were divided into control and main groups of 12 female athletes. Work experience: 3-4 years. Type of training in both groups – online training. The training process of the main group for the development of physical qualities included special exercises on the coordination ladder. In the training process of the control group for the development of physical qualities, exercises from the program were used.

To assess the strength qualities of female athletes, the following tests were used: T1-lifting the legs in the hang on the gymnastic wall until the foot touches the rail behind the head (number of times); T2 – «Hanging angle», (s); T3 - lifting the legs to a right angle in the hang on the gymnastic wall (number of times). To assess the speed-strength qualities of female gymnasts, the following tests were used: T4-jumping up, bending over from a squat (number of times in 20 s); T5 pull-ups in 10 s (number of times); T6 long jump from a place (cm). To assess the coordination abilities of gymnasts, the «Yula» test was used, (s) (according to Karpenko L.A., Viner I.A., Sivitsky V.A., 2007) and shuttle run 4x9 m, (s) (Order of the Ministry of Youth and sport of Ukraine, 2018). Group results were compared using Student's t-test and nonparametric Rosenbaum's t-test (Q).

Results: as a result of the introduction of a methodology using special exercises on the coordination ladder to increase the level of physical fitness of female gymnasts 8-9 years old during online training, statistically significant (p<0,05–0,01) improvements in performance were obtained for all tests, except the result of the «Hanging angle» test (static strength). The best results were shown by female gymnasts in speed-strength jumping exercises (T4; and T6) and coordination exercises (T7 and T8), where the probability of significant differences reached 99% at p<0,01. In tests for the development of speed-strength qualities and dynamic strength of the abdominal press and arms, the proposed exercises on the coordination ladder turned out to be effective, which was confirmed by the results of tests T1, T3, T5.

Conclusions: the positive influence of the developed methodology with the use of special exercises on the coordination ladder on the level of physical fitness of female gymnasts 8-9 years old during online training was determined. It was established that the proposed methodology contributed to the increase in the level of physical fitness of female athletes of the MG in all tests in comparison with the results of female athletes of the CG. The results obtained testify to the effectiveness of the developed methodology and allow us to recommend it for use in the training process of athletes in gymnastic sports at the stage of initial and basic training, for recreational and training sessions. The proposed exercises can be used both during online and offline training.

Key words: coordination ladder, physical fitness, testing, young female gymnasts.

DOI: 10.15391/snsv.2023-2.006

Received: 10.05.2023; Accepted: 27.05.2023; Published: 30.06.2023

Citation: Krasova I, Deineko A, Semyzorova A, Marchenkov M, Bilenka I, Riabchenko O. Coordination ladder as a modern means of online training to improve the physical fitness of female gymnasts 8-9 years old. Slobozhanskyi Herald of Science and Sport. 2023; 27(2):99–107. https://doi.org/10.15391/snsv.2023-2.006

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Мета: визначити ефективність розробленої методики з використанням спеціальних вправ на координаційній драбині для підвищення рівня фізичної підготовленості гімнасток 8-9 років.

Результати: Експертна група встановила, що запропонована методика сприяла підвищенню координаційної драбини на рівень фізичної підготовленості гімнасток 8-9 років під час онлайн тренувань.

Матеріал, учасники та методи: 24 спортсменки віком 8-9 років, які займаються спортивною гімнастикою у групі базової підготовки першого року навчання були поділені на контрольну і основну групи по 12 спортсменок. Досвід занять: 3-4 роки. Вид занять в обох групах – онлайн тренування.

Тренувальний процес основної групи для розвитку фізичних якостей були включені спеціальні вправи на координаційній драбині. У тренувальному процесі контрольної групи для розвиток фізичних якостей використовувались програмні вправи.

Для оцінки силових якостей спортсменок застосовувалися тести: Т1-піднімання ніг у висі на гімнастичній стінці до торкання за головою рейки (рази); Т2- кут у висі (с); Т3- піднімання ніг до прямого кута у висі на гімнастичній стінці (рази). Для оцінки швидкісно-силових якостей гімнасток використовувалися тести: Т4-вистрибування вгору, протунувшись з присіду (рози за 20 с); Т5-стрибок у довжину з місця (см); Т6- підтягування у висі до торкання за головою рейки (рази); Т7- стрибок у довжину з присіду (с); Т8- підтягування у висі до торкання за головою рейки (рази).

Висновки: Висновки виявилися ефективними, що підтвердило результатами тестів Т1, Т3, Т5.

Висновки: Визначено позитивний вплив розробленої методики з використанням спеціальних вправ на координаційній драбині для підвищення фізичної підготовленості гімнасток 8-9 років під час онлайн тренувань. Встановлено, що запропонована методика сприяла рівню фізичної підготовленості гімнасток 8-9 років під час онлайн тренувань.

Ключові слова: координаційна драбина, фізична підготовленість, тестування, юні гімнастики.

Introduction

Modern gymnastics is rapidly developing, becoming more complex and changing [9, 36, 38]. To keep up with the trends in the development of the sport, gymnasts are forced to make incredible efforts to achieve a competitive sports result. Hard work on improving technical skills and physical fitness is the main direction in the preparation of athletes [11, 28, 37]. In gymnastics, without the proper level of physical fitness, it is impossible to achieve results in the training and competitive process [36, 38]. At present, when athletes are limited in physical activity and do not have the opportunity to fully engage in sports, it is important to maintain the already achieved level of physical fitness and prevent the deterioration of the child’s health in general [8, 18]. The rapid development of artistic gymnastics and early specialization require appropriate effective training methods [11, 28, 36]. This is one of the key reasons why modern gymnastics has to rely heavily on scientific research [22, 41]. In today’s environment, this approach is of particular importance. Artistic gymnastics is a sport where, without regular systematic training, you can quickly lose your sporting achievements and never return them in the future. The impossibility of training in gyms puts forward the need to find alternative ways to maintain and improve sports form. In such conditions, online training becomes relevant - a type of motor activity using techniques adapted for home conditions that allow you to maintain and improve physical fitness [7, 27, 29, 35]. At present, it is timely to use non-traditional and affordable means of training young athletes, especially at the stage of basic training, when gymnasts already have certain achievements and their further result depends on the effectiveness of the training process [11, 37]. Such an alternative means can be the use of multicomponent and multifunctional exercises on the coordination ladder, which can be effectively applied in online conditions. It should be noted that exercises on the coordination ladder are not a traditional means of training in artistic gymnastics. More often it is used in team sports, boxing, martial arts, where the effectiveness of its use for the development of physical qualities and the improvement of technical training has been scientifically proven [3, 4, 17, 34]. Therefore, the experience of other sports, in our opinion, allows us to try the use of exercises on the coordination ladder in artistic gymnastics with girls who train at the stage of basic training.

The coordination ladder (speed ladder, gymnastic ladder) is one of the most common and effective simulators for the complex development of physical qualities (dexterity, endurance, speed, balance and coordination of movements). Also, during the exercises on the coordination ladder, the cardiovascular system is trained, leg muscles are developed, which are responsible for jumping ability and the development of speed-strength qualities. It is used in both individual and group classes [3, 4, 17, 34]. Given that the level of physical fitness is determined not only by one physical quality, but by their combination [10, 11, 25, 37], then the value of exercises on the coordination ladder lies precisely in the fact that they provide an opportunity for the complex development of physical qualities [3, 4, 17, 34]. Analysis of scientific and methodological literature [8, 16, 20 32] showed that a lot of attention has been paid to the problem of developing physical qualities in gymnastic sports and there are a large number of evidence-based methods for their development at all stages of training gymnasts, but simple, afford-
able and effective methods for the integrated development of physical qualities that can be used in online training in gymnastics is not described enough. Unfortunately, there is practically no scientific data on the use of the coordination ladder in the training process in artistic gymnastics, which determined the direction of our research.

**The relationship of work with scientific programs, plans, topics.** The study was conducted in accordance with the initiative topic of the scientific research of the Department of Gymnastics, Dance Sports and Choreography of the KhSAPC: «Theoretical and methodological foundations for the development of backbone components of physical culture (sport, fitness and recreation) for 2020-2025».

**The purpose of the study:** to determine the effectiveness of the developed methodology using special exercises on the coordination ladder to increase the level of physical fitness of female gymnasts 8-9 years old during online training.

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**Material and Methods**

**Participants**

The study involved 24 female gymnasts aged 8-9 years who train in the basic training group of the first year of study. Work experience: 3-4 years. The training took place online. The participants of the study were divided into two groups: the main group (MG) and the control group (CG) of 12 gymnasts each. Special exercises on the coordination ladder were introduced into the training process of the main group for the complex development of physical qualities. In the training process of the control group, for the development of physical qualities, exercises from the program were used, but those that could be performed online. All female gymnasts and their parents were informed about the nature of the study and gave informed consent to participate and process the data obtained.

**Methods.** To achieve the goals set during the study, pedagogical observations, pedagogical testing, pedagogical experiment, methods of mathematical statistics were used. To assess the level of physical fitness of female athletes aged 8-9, 8 tests were selected, six of which are offered by the Artistic Gymnastics Curriculum for Youth Sports Schools, schools of higher sportmanship in Artistic Gymnastics [30]: lifting the legs in a hanging position on the gymnastic wall until it touches the rail behind the head (number of times); pull-ups for 10 s (number of times); standing long jump (cm) were used to assess the speed-strength qualities of female athletes; «Hanging angle» (s) and lifting the legs to an angle of 90° in hanging on the gymnastic wall (number of times) were carried out to assess the strength qualities of female gymnasts. To assess the speed-strength qualities of female athletes, a test was used: jumping up from a position, bending over from a squat (number of times in 20 s). To assess the coordination abilities of gymnasts, the «Yula» test was used, (s) (according to Karpenko L.A., Viner I.A., Sivitsky V.A., 2007) and shuttle run 4x9 m, (s) (Order of the Ministry of Youth and sport of Ukraine, 2018).

**Procedure**

Testing the level of physical fitness of female gymnasts 8-9 years old was carried out twice during the training meeting: at the beginning of the study (August 2022, Lithuania) and at the end of the study (February 2023, Ukraine, Transcarpathia). The results of the initial testing of female gymnasts of the main (n=12) and control (n=12) groups revealed the absence of significant differences in the performance of the proposed test exercises.

Both groups of young athletes trained in accordance with the Curriculum for the Youth Sports School and the School of Higher Sportmanship in Artistic Gymnastics [30] taking into account online conditions, but in the training sessions of gymnasts of the main group (n=12), special exercises on the coordination ladder were included, aimed at the comprehensive development of physical qualities.

The coordination ladder is a flat flexible structure made of polypropylene with plastic rungs interconnected at the edges by flexible tape slings (Figure 1). On the sides, the simulator has fasteners, which allows you to independently adjust the length of the cell and fix it in a certain position. Due to the impossibility of acquiring a ladder made at the factory, a home-made one was used: made of fabric, rope, laid out on the floor with adhesive tape, drawn with chalk or paint. Ladder length – 4,5 – 5,0 m, width – 50 cm, number of cells - 9-10, cell length – 50 cm.

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**Figure 1. Coordination ladder**

A square staircase measuring 1.5 x 1.5 m with nine squares (50 cm x 50 cm) was also used, which was laid out with adhesive tape or drawn on the floor (Figure 2). The squares were numbered from 1 to 9.

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     1   2   3
     4   5   6
     7   8   9
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**Figure 2. Square coordination ladder**

During the 6 months of the study, exercises on the coordination ladder were used at each online training (4 times a week) in the preparatory and main parts for 40-50 minutes with a total training time of 135 minutes [30].

The developed methodology made it possible to build training in such a way that the exercises on the coordination ladder were consistent, had a complex effect and combined a warm-up (20 minutes) and the main part of the session. With a total duration of the main part of 90-100 minutes, exercises on the coordination ladder were 25-30 minutes. Practice has shown (visual observations) that this is the optimal time for applying exercises on the ladder during online training for gymnasts of this age and fitness level. With an increase in time by 5-10 minutes, the girls experienced fatigue, which was manifested in a decrease in attention, a decrease in speed, a deterioration in the technique of performing exercises and the accuracy of hitting the cell. The girls stepped on the crossbeams of the ladder, which is not allowed to be done.

In the preparatory part of the lesson, varieties of walking, running, jumping at a slow and fast pace, walking with acceleration, general developmental exercises and their combination into special sets of exercises adapted to constant changes in the dimensions of the ladder cell and the direction of movement were used. Exercises were performed at different speeds and constant control over the technique of performing exercises.
This technique made it possible to maximize the use of the motor skills of the arms and legs. For example, when performing exercises with acceleration, their technique required the simultaneous and equal in amplitude movement of the arms and legs, as well as the maximum decrease in the center of gravity to maintain balance on the coordination ladder. And changing the dimensions of the ladder cell when performing the same exercises in positions not inherent in gymnastics prompted the inclusion of internal muscles of the musculoskeletal system that were not yet involved in the work. Female athletes had to maintain or adjust their body position all the time to maintain balance. The impact of the exercises was also enhanced by ensuring that the feet were kept to a minimum and maintained in the correct position during the exercise. Flexibility exercises were used throughout the entire workout (3-4 times) for rest, switching attention and to enhance the effect of strength exercises.

In the main part of the lesson, the combined above-mentioned exercises and special exercises were used, such as walking in a handstand, moving in an emphasis lying down (walking and jumping), walking in the “bridge” position, somersaults for accuracy and other exercises related to special and general physical training of female athletes. Also, ligaments and connections of acrobatic, choreographic and dance exercises were used, which were performed with different amplitude and intensity to musical accompaniment. For these exercises, a square ladder was used more, which allowed performing movements in different directions or combining directions of movements, that is, moving along the perimeter of the stairs, diagonally, counter-moving and “snake”. A special exercise that all female gymnasts liked and was played as a game with elements of competition was the performance of jumps or other movements in squares with numbers that were given by the coach. Jumps were performed in a square with a given figure on both, on one, from one to the other leg, back forward at the speed of the exercise. The winner has to be determined. Also, small rectangular or square plastic containers with sand weighing 1-2 kg were used, which, according to the assignment, were required to move the foot with a small jump into a given square. In this exercise, the winner was also revealed. Thus, the use of a square ladder brought elements of novelty, diversity and competition into the girls’ training process, made it possible to unobtrusively complicate the exercises, and increased their mood and desire to train. This was reflected in the improvement in the quality of exercise performance.

When training on the coordination ladder, the peculiarity of the methodology was that attention was paid to the technique and accuracy of performing exercises more than speed. Speed was added only after mastering the technique. Given that the exercises on the coordination ladder were performed at short distances, a large number of repetitions (7-10 times) was important. As it turned out, the small length of the ladder for individual lessons is not a disadvantage, but rather a great advantage. This made it possible to do exercises in both directions. The constant change of direction added variety to the exercises, made it possible to perform other exercises in the opposite direction, saved time due to the current performance of exercises with small pauses for rest. Such a methodical technique prompted attention, contributed to the development of coordination, and made it possible to do certain exercises with a constant increase in tempo and intensity, with the exception of collisions and injuries. If necessary, individual exercises were used. The exercises became more difficult gradually, but 2-3 new ones were added at each lesson. Sports equipment was widely used: balls, rubber bands, jump ropes, light dumbbells (1-2 kg) or sandbags for wrists and shins.

To develop coordination on the ordinary and square ladder, exercises were used - motion manipulations with a tennis racket and a ball, with inflatable balls.

Thus, the combination of the preparatory and the main part of the online training had significant overall advantages:
- saving time due to forged exercises in both directions;
- the use of power, speed-strength exercises and special sets of exercises with musical accompaniment, which made it possible to change the pace, rhythm and intensity of the movements;
- constant change of the direction of movements and the leading leg;
- combination of static positions with dynamic exercises in one approach;
- the use of quick movements with one leg, the other was used as a support;
- use of a series of jumps for 30-60 s;
- use of special exercises for flexibility both on the coordination ladder and beyond it;
- use of exercises with objects;
- use of individual exercises as necessary.

Almost all the exercises used are aimed at improving coordination, speed, speed-strength abilities, flexibility and movement technique. Other training times were used to repeat and teach the technique of performing exercises and special physical training exercises that could be performed under existing conditions.

The final part of the online training was 10-15 minutes, included general developmental flexibility exercises, musical improvisation, relaxation exercises and individual recovery tools available.

**Statistical analysis**

The assessment of the statistical significance of the results of a comparative analysis of the indicators of the main and control groups that were studied was carried out using the statistical software package Statistika 5.11, Excel. At the beginning of the study, an analysis of the studied sample data was carried out for compliance with the normal distribution law using the Shapiro-Wilk test. Since the indicators of physical fitness of young gymnasts corresponded to the normal distribution law (W=0,89; W=0,97; P>0,05), descriptive statistics indicators were determined: arithmetic mean (X) and standard deviation (SD). The analysis of the statistical indicators of the initial study according to the Student’s criterion revealed unreliable differences in the results obtained for all the proposed tests, which made it possible to state an acceptable difference in the initial level of physical fitness of female gymnasts of both groups (Table 1). At the final stage of the study, using the non-parametric criterion of Rosenbaum signs, an assessment was made of the reliability of differences in the average statistical values of physical fitness indicators of female gymnasts from the main and control groups (Table 2).

**Results**

The results obtained are presented in tables 1 and 2.

After six months of training with the use of special exercises on the coordination ladder, the level of development of physical fitness of young women gymnasts of the main and control groups was retested. The results obtained are presented in Table 2.
The results of tests T1 “Hanging leg raises on the gymnastic wall to touch the rail behind the head” (number of times); T3 “Lifting the legs to the angle of 90° in the hang on the gymnastic wall, the number of times”; T4 “Jumping up from a squat, the number of times in 20 seconds” and T6 “Standing long jump, cm”, characterizing the speed-strength qualities of female athletes, also in tests for coordination T7 “Yula” (s) and T8 “Shuttle run 4x9 m” (s) were also identified significant changes in the results between the main and control groups (p<0.05), although their slight improvement occurred in both groups. The best results were shown by female gymnasts in speed-strength jumping exercises (T4; and T6) and coordination exercises (T7 and T8), where the probability of significant differences reached 99% at p<0.01. As for the development of speed-strength qualities and dynamic strength of the abdominals and arms, the proposed exercises on the coordination ladder turned out to be effective with a 95% reliability at p<0.05, which was confirmed by the results of tests T1, T3, T5.

Discussion

As a result of the study, it turned out that in recent years, many experts have been discussing and considering gymnastics not only as a complex sport that experienced athletes do, but also as a positive basic activity, which is an excellent tool for...
teaching motor skills and improving the health of children of all ages [22, 42]. The authors also do not exclude the possibility of doing gymnastics to achieve sports results. However, there is another opinion of the authors [23], considering gymnastics only as a recreational activity. They propose to include simple gymnastic exercises in physical education curricula or sports training programs for children of all ages. And gymnastics as a sport is offered only to talented physically prepared children.

Despite different opinions regarding gymnastics, we agree with the majority of authors [1, 33, 38], who argue that gymnastics requires athletes to possess many physical qualities. The most important of these are strength, speed, flexibility, coordination, as well as the harmony of movements and musicality. Specialists [13, 36, 37] agree that a high level of physical fitness is necessary to obtain a sports result, and this is a very difficult task and an integral part of the preparation process in almost all sports, especially in sports with complex coordination of movements. They also point out that modern sport and its development trends necessitate continuous improvement of all factors affecting the result. We also agree with these experts regarding the assertion that for further sports development it is necessary to provide a good motor base in accordance with the stage of preparation, to improve the leading physical qualities in a timely manner, taking into account the sensitive period of development of athletes.

We unanimously support the opinion of many authors [2, 15, 18, 32] who are concerned about the current trend towards a decrease in the motor activity of school-age children, which is manifested in the deterioration of health and a decrease in their level of physical fitness. Scientists propose to use in the training process of athletes additional various means, simulators and new physical exercises that do not require special equipment, material and physical costs, but are effective and interesting for children. And the use of alternative methods and means of physical activity that can be used at home during self-study or online training should help not only not to lose the already achieved level of physical fitness, but, on the contrary, to improve it.

The results of the conducted studies confirm and supplement the data of specialists [28] regarding the statement that the long-term gradual development, maintenance and improvement of the physical form of gymnasts without forcing the training process is the key to achieving high results in competitions. Also, these authors indicate that one of the main tasks of the FIG (International Gymnastics Federation) is to search for new methods of teaching not only gymnasts, but also coaches to improve their knowledge, which will ensure the effectiveness of the training process in physical, technical and psychological preparation and at the same time will not inflict damage to the health of gymnasts.

Considering from this position online - training on the use of a coordination ladder on it, which is not a traditional simulator in artistic gymnastics, it can be argued that both the athletes and the coach studied. At what they learned not only to conduct online training, but also to use the coordination ladder on it.

Our studies have found that exercises on the coordination ladder have recently gained any popularity in the training process of athletes, especially in team sports. So, in work [39] the effect of a significant improvement in the maneuverability of movement in badminton players was revealed when the classical training program was supplemented with exercises on the coordination ladder. Bykova O. (2016) proved the effectiveness of exercises on the coordination ladder in handball. All authors indicate that exercises on the coordination ladder have a positive effect on the technical, tactical and physical fitness of athletes, which is significantly manifested in the improvement of their coordination abilities. This is also confirmed by the results of our study, where significant changes in the results of tests for coordination were determined (T7 “Yula” (s) and T8 “Shuttle run 4x9 m” (s)) between the main and control groups with a probability of 99% at p<0,01.

Our studies have revealed that online training on the coordination ladder with young female gymnasts does not lose in effectiveness, but rather contributes to the complex development of physical qualities, has a positive effect on the mental state of female athletes. The complex development of physical qualities at this stage of training plays almost the main role in achieving further sports results [11, 13, 37]. But the transition of female athletes from the stage of initial training to the stage of basic training takes place against the backdrop of a contradiction with the Curriculum for the Youth Sports School in artistic gymnastics [30]. On the one hand, the Curriculum indicates that at the age of 8-9 years, girls can still train at the initial stage, where the main means of developing physical qualities are game exercises that have a complex effect on the physical fitness of female gymnasts [14, 30, 40]. But on the other hand, if girls of this age train already at the stage of basic training, then the game method, as a rule, is practically not used, although it is recommended by the Program, and the development of motor qualities often occurs in a forced manner with the dominance of attention separately on the development of strength, speed-strength qualities and flexibility. And coordination abilities are most often developed with the help of choreographic and trampoline training, as well as special exercises that are close to the technique of the sport. But, as you know, the age of 7-10 years is a sensitive period for the development of this quality and now it is necessary to purposefully use various methods of its development [6, 21, 31]. Forcing the entire training process in general [22, 36], which manifests itself in an increase in training time and a decrease in time for learning complex elements on gymnastic equipment, non-compliance with the daily routine and nutrition, the use of insufficient and ineffective recovery measures leads to injury and unwillingness to train. Therefore, it is clear why already at the age of 12-14, due to injuries and other factors (puberty, deterioration in the level of physical fitness, decrease in motivation, unstable mental state), many girls end their sports career. Most often, the reason lies in the fact that after the transition to the stage of basic training, due to the physiological characteristics of children of this age and as a result of a narrowly focused physical training, the development of their motor qualities occurs unevenly. As a result, instead of an advanced level of development of physical qualities, girls accumulate a lack of them [30]. As a result, after 2-3 years, a female gymnast begins to fail to cope with the training load, her results deteriorate, and her motivation decreases. The issue of finishing training in gymnastics or switching to another sport becomes relevant. Therefore, today there is an urgent need to use alternative and affordable exercises in the training process of girls for the integrated development of physical qualities, which can also be effective during online training. Our research has shown that coordination ladder exercises can be effectively used in online gymnastics training. They have a positive effect on the complex development of the physical qualities of young female gymnasts, confirming significant improvement in the results in all tests, except for the results of the «Hanging angle» test (s), where an unreliable difference was obtained between the performance of gymnasts from the main and control groups (p>0,05), although their slight improvement occurred in both groups. The results obtained in this test can be explained by
the fact that in the conditions of online training, female gymnasts did not have the opportunity to perform at least simple exercises in the hangs. The technique of performing exercises on uneven bars requires maintaining the necessary body position in each element [26]. It is impossible to perform such exercises on the gymnastic ladder, therefore, in both groups, special static and static-dynamic exercises were used in the stops, various holding positions to develop the static strength of the abdominal press. But, as it turned out, in the conditions of online training without performing special exercises in the hangs on the uneven bars or the crossbar, it is difficult to develop the static strength of the abdominal press, which was confirmed by the test of the «Hand angle» test in both groups. But, as for the development of speed-strength qualities and dynamic strength of the abdominals and arms, the proposed exercises on the coordination ladder turned out to be effective with a 95% reliability at \( p<0.05 \), which was confirmed by the results of the tests T1, T3, T5. And in speed-strength jumping exercises (T4; and T6) and coordination exercises (T7 and T8), the probability of significant differences reached 99% at \( p<0.01 \).

Thus, the results obtained in our study are in full agreement with the data of the authors [3, 4, 17, 39], but not in gymnastics, but in other sports. Unfortunately, we could not find data on the use of the coordination ladder in artistic gymnastics. But the results obtained confirmed that the use of exercises on the coordination ladder, first of all, has a positive effect on the development of strength, speed-strength and coordination abilities, which are the leading ones in gymnastics. Thus, our study supplemented the results of previous authors with data confirming the effectiveness of the use of the coordination ladder in various sports. The data of these authors were confirmed that the coordination ladder is one of the most accessible and effective simulators both for recreational activities and for training athletes in many sports, where active exercises are used to develop strength, speed-strength qualities, and coordination. All authors emphasize that the use of the coordination ladder contributes to the development of both large and deep muscles that form the frame of the musculoskeletal system and are the most difficult to train. Only a limited number of types of exercises can use them. And the results of our research have proven that the use of exercises on the coordination ladder can be effective also in online training.

**Conclusions**

The positive influence of the developed methodology with the use of special exercises on the coordination ladder on the level of physical fitness of female gymnasts 8-9 years old during online trainings was determined. It was established that the proposed methodology contributed to the increase in the level of physical fitness of female athletes of the OG in all tests in comparison with the results of female athletes of the CG. The results obtained testify to the effectiveness of the developed methodology and allow us to recommend it for use in the training process of athletes in gymnastic sports at the stage of initial and basic training, for recreational and training sessions. The proposed exercises can be used both during online and offline training.

**Prospects for further research** are to introduce exercises on the gymnastic ladder into the educational and training process of athletes at all stages of training in gymnastic sports, followed by monitoring their level of physical fitness.

**Conflict of interest.** The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the article.

**Sources of funding.** This article received no financial support from a government, public or commercial organization.

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