

COMPLEX OF EXERCISES FOR STRENGTHENING LOWER EXTREMITIES IN STREET BASKETBALL

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ABSTRACT

Street basketball known in English as: Streetball (street basketball) is a sport similar to basketball. Appeared in the 1950s in the USA. Basketball is one of the most popular sports both in America and in many other countries. However, the interest in the game does not come without the risk of injury. The most common injuries encountered among the practice of this sport are ankle sprains, knee injuries, deep thigh bruises, foot fractures, ankle sprains, achilles tendinitis, knee tendinitis, muscle strains, cruciate ligament tears and fractures of the fingers. The purpose of the report is to present a methodology with exercises to strengthen the lower limb in street basketball. The subject of the report is the presentation of a methodology for the strengthening exercises of the lower limbs in street basketball. The object is the methodology for strengthening exercises. Tables and pictures are used to illustrate the methodology. The methodology proposed by us includes a set of exercises that strengthen the muscles and joints, improving stability and power endurance in the area of the lower limbs, mainly including exercises with the body's own weight and resistance bands.

Keywords: Street basketball, strengthening exercises, resistance bands, isometric

КОМПЛЕКС ОТ УПРАЖНЕНИЯ ЗА УКРЕПВАНЕ НА ДОЛНИ КРАЙНИЦИ ПРИ СТРИЙТ БАСКЕТБОЛ

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РЕЗЮМЕ

Стрийт баскетболът, познат на английски като Streetball (уличен баскетбол), е спорт, подобен на баскетбола. Появява се през 1950-те години в САЩ. Баскетболът е един от най-популярните спортове както в Америка, така и в много други държави. Въпреки големия интересът към играта съществува и риск от различни наранявания. Най-честите травми, срещани сред практикуващите този спорт, са навяхвания на глезена, травми на коляното, дълбоко натъртване на бедрото, фрактури на ходилото, тендинит на ахилесовото сухожилие, тендинит на коляното, мускулни разтежения, разкъсване на кръстни

връзки и фрактури на пръстите. Целта на доклада е да се представи методика с упражнения за укрепване на долния крайник при стрийт баскетбола. Предмет на доклада е представянето на методика за укрепващите упражнения на долни крайници при стрийт баскетбол. Обект е методиката за укрепващи упражнения. За онагледяване на методиката са използвани таблици и снимки. Предложената от нас методика обхваща набор от упражнения, които укрепват мускулатурата и ставите, като подобряват стабилността и силвата издръжливост в областта на долните крайници, включвайки упражнения предимно със собствена тежест на тялото и ластиси.

Ключови думи: стрийт баскетбол, укрепващи упражнения, тренировъчен ластик, изометрия

INTRODUCTION

Street basketball, known in English as: "streetball" (street basketball), is a sport similar to basketball (Wikipedia contributors, 2023). It is a variation of basketball, typically played on outdoor courts and featuring significantly less formal structure and enforcement of the game's rules. As such, its format is more conducive to allowing players to publicly showcase their own individual skills (Streetball - Insidehoops.com, n.d.). Appeared in the 1950s in the USA. Basketball is one of the most popular sports, both in America and in many other countries (Basketball: The Most Popular Sports, 2021). The history of streetball in New York City and its roots run as deep as those of the majority of professional sporting teams, with stories of local legends from parks around the city that rival those of even the most prolific professional athletes. For some, streetball isn't just a sport, it's a way of life and a culture that the people embrace (Mitchell, 2014).

Basketball is typically played in enclosed, specially equipped spaces. It has set rules and regulations and referees who watch out for any fouls. On the other hand, streetball It's much less formal, and the rules vary depending on who is playing. It's much more improvisational than traditional basketball and requires different court surfaces and types of balls since it's played outside, which can lead to more injuries as there are no regulations (Streetball and Basketball, n.d.).

As in any other sport, interest in the game itself does not come without the risk of injury. Basketball is found to be the most dangerous sport in 2021, 64% more dangerous than American football (Gillin, 2022). The most common injuries encountered in the practice of this sport are ankle sprains, knee injuries, deep thigh bruises, foot fractures, ankle sprains, achilles tendinitis, knee tendinitis, muscle strains, cruciate ligament tears, and fractures of the fingers (Basketball injuries, n.d., Miyasaka, 1991). Studies found by the National Basketball Association (NBA)

about injuries and player demographic information reported that ankle and knee injuries have the highest percentages (Drakos et al., 2010).

In the morphology of movements in basketball, the stability of the lower limbs during manoeuvring movements, especially on one leg, is of the greatest importance for the movement of the whole body (Foley D., 2021). A biomechanical deficiency in the lower leg, especially the ankle and knee, will cause forces to be directed in various planes of movement rather than allowing proper movement. This may start to develop injuries after some time due to the repeated stress and strain on the body (Guest Blogger, 2020).

Resistance bands are excellent for enhancing the quality of your workouts and developing your motor skills. They aid in muscular stabilization and muscle strength, and are an excellent tool for enhancing your overall exercise form (The benefits of resistance, 2023). Isometric exercises are proven to engage more muscle fibres and build strength up to 66% faster than lifting weights. Studies suggest using 7–10 second isometric holds with 60%–80% effort is the optimal form (Seththekid, 2020). As evidenced by studies demonstrating positive outcomes following the execution of these sorts of contractions, they have a variety of effects on the body (Noorkõiv et al., 2015; Schott et al., 1995).

The purpose of the report is to present a methodology with exercises to strengthen the lower limb in street basketball.

METHODS

Research methods is methodology proposed by authors includes a set of exercises that strengthen the muscles and joints, improving stability and power endurance in the area of the lower limbs, mainly including exercises with the body's own weight and resistance bands.

Subject of report is methodology for the strengthening exercises of the lower limbs in street basketball.

Object of report is the methodology for strengthening exercises.

Tables and pictures are used to illustrate the methodology.

The methodology of exercises

The methodology of exercises is to be applied for 30 days in order to achieve the desired result.

The exercise complex alternates isotonic and isometric exercises on the same joint, covering the muscles involved in the movement, starting with bodyweight exercises and following the exercises with static holds with a resistance band.

Their execution is described on one leg, and then the movement is also performed on the other leg. It is of great importance that the resistance band is correctly selected according to the level of training. Each exercise begins with dynamic repetitions without resistance in order to warm up and move the joints and muscles, after which the corresponding resistance band is included for static loading. The resistance band must be placed on the designated area described for each exercise to optimally achieve the desired results.

As follows:

Table 1. *Reviewing the characteristics of the training program*

Duration of training	30 days
Performances per day	1
Number of exercises	12
Phases of exercise	2
Exercise duration	5 x 20 sec. (10 sec. each leg)
Duration of workout	25 min
Breaks duration	30-40 sec
Execution	Slow pace
Load type	Isotonic and isometric
Breathing rhythm	Deep slow breathing

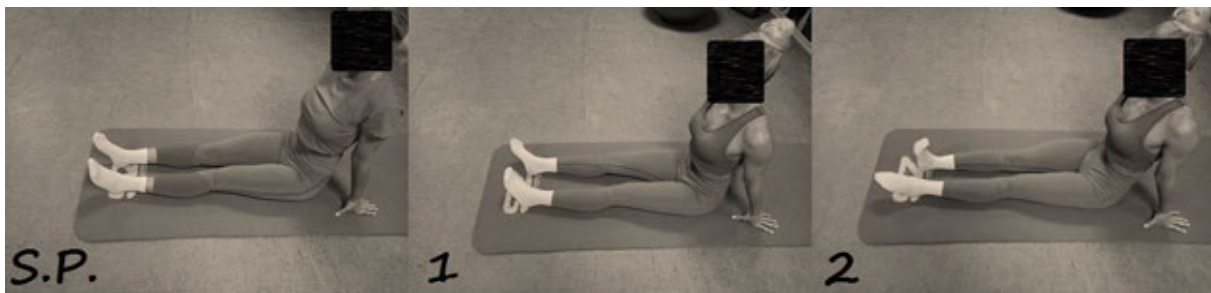


Figure 1. *Exercises for the lower leg*

Figure 1 shows the starting position (S.P.) and the first two exercises, which mainly cover the lower leg muscles. Both exercises are performed in a sitting position on the floor on a training mat (desirable), the body is in an upright position so that the muscles of the back do not are not relaxed and the back is straight and the legs are stretched out in front with a slight distance between them. In the first exercise, the feet are rotated to the sides at the same time in both directions. The second exercise follows, in which, from the same starting position, the feet are crossed so that one points towards the body and the other forward. Repeats are performed at the time indicated in Table 1.

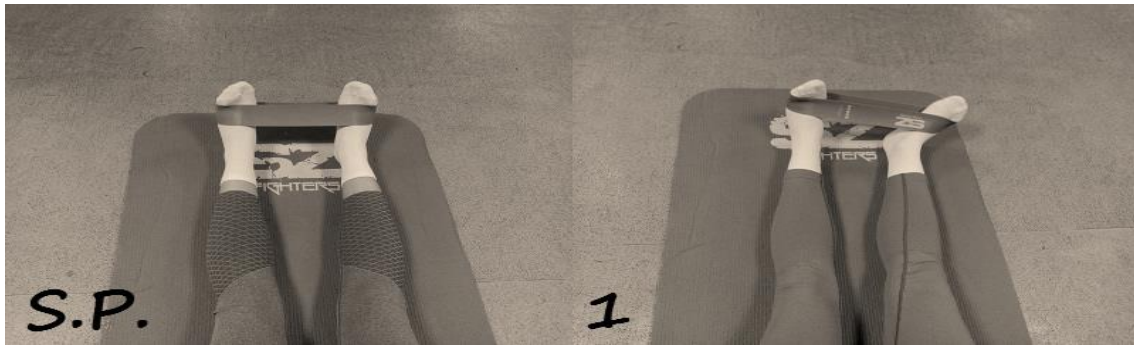


Figure 2. *Exercise for the lower leg with resistance band first variant*

The first exercise for the lower leg with a resistance band is presented in Figure 2. The starting position is the same as in the first exercise. The training band is placed around both feet above the middle of the foot. The exercise is performed by stabilizing one foot, moving the other to the sides, and holding the position for the time indicated in Table 1.



Figure 3. *Exercise for the lower leg with resistance band second variant*

Figure 3 shows the second exercise with a resistance band for the lower leg. The starting position is the same as the previous ones. However, the training leg is bent and placed over the stabilizing one. The resistance band is placed at the same level as in the first exercise in Figure 2. The movement of the foot is in the opposite direction of the stabilizing leg, and the position is held for the indicated time from Table 1.

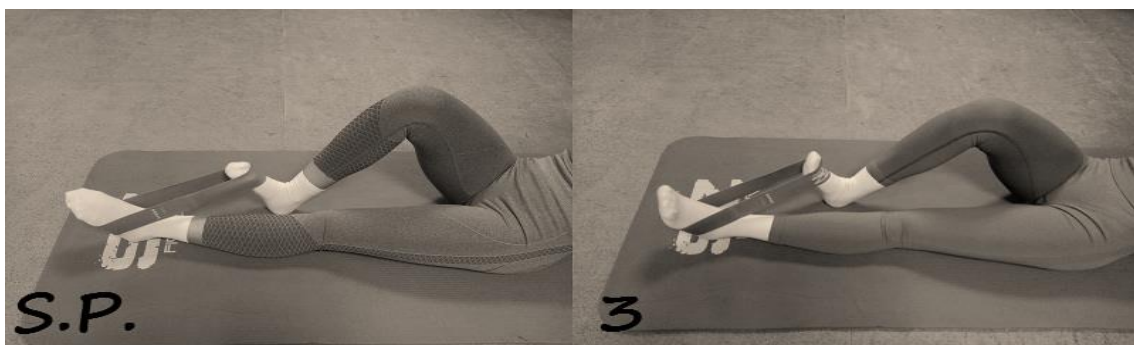


Figure 4. *Exercise for the lower leg with resistance band third variant*

Figure 4 illustrate the third exercise with a resistance band for the lower leg. The starting position is the same as the previous ones, but the training leg is bent at the knee without lifting the heel from the mat. The resistance band is placed at the same level as the previous exercises. The bent leg performing the movement pulls the resistance band with the top of the foot and holds the position for the time indicated in Table 1.

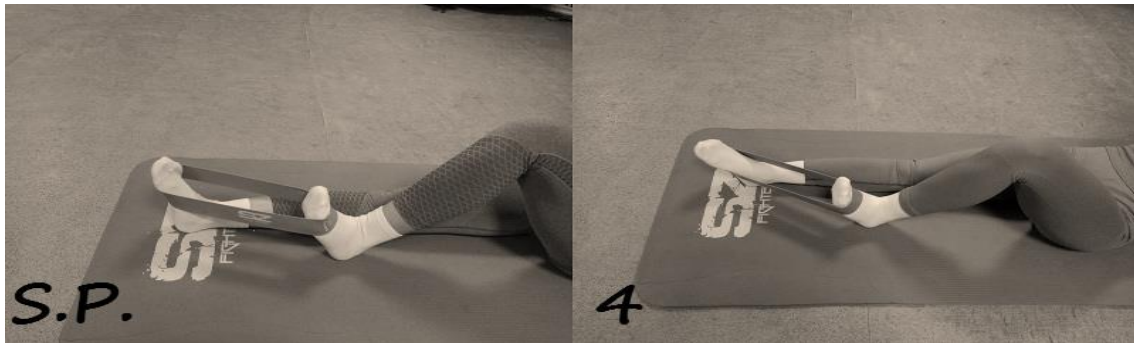


Figure 5. *Exercise for the lower leg with resistance band fourth variant*

Figure 5 shows the fourth exercise with a resistance band for the lower leg. The starting position is the same as in the fourth exercise. But the stabilizing leg is bent at the knee without lifting the heel from the mat. The resistance band is placed at the same level as the previous exercises. The stretched leg performing the movement pushes the resistance band with the sole of the foot and holds the position for the time indicated in Table 1.



Figure 6. *Exercises for the thigh*

Figure 6 present the starting position (S.P.) and the first three exercises, which mainly cover the thigh muscles. The starting position is the same as the previous ones. The first exercise is performed by lifting the leg up 45–60 degrees in an extended position. The second exercise is performed by raising the extended training leg and crossing it over the other one that is on the mat. On the third exercise, it is performed by bending the training leg at the knee all the way. Repeats are performed at the time indicated in Table 1.

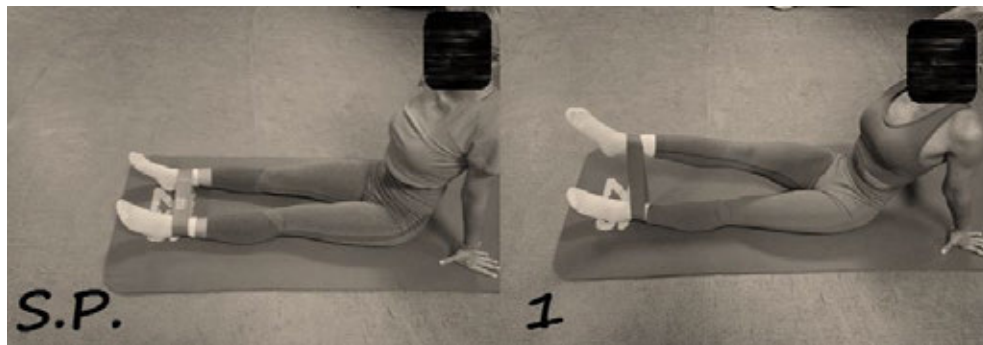


Figure 7. Exercises for the thigh with resistance band lifting variation

Figure 7 illustrates the lifting variation for exercise of the thigh with a resistance band. The starting position is the same as the previous ones. The resistance band is put on the ankles. The exercise is performed as the first exercise indicated in figure 6. The training the leg is raised with the extra force added from the resistance band, the stabilizing leg stays on the mat. The training leg holds the position for the time indicated in Table 1.

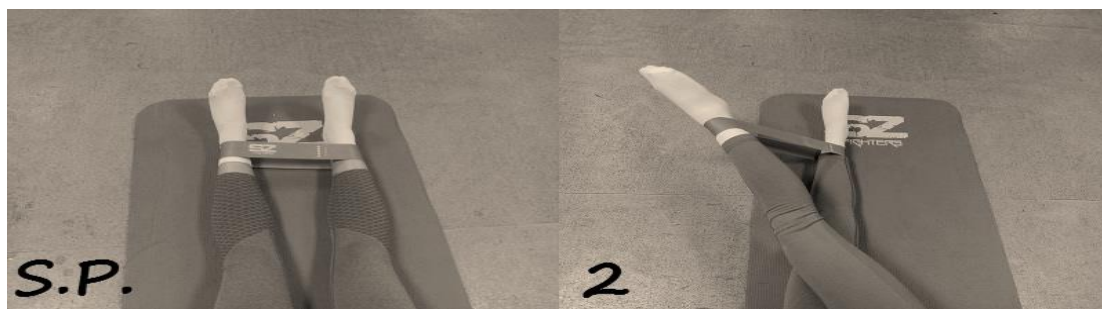


Figure 8. Exercises for the thigh with resistance band crossing variation

Figure 8 illustrates the crossing variation for exercise of the thigh with a resistance band. The starting position is the same as the previous ones. The resistance band is put on the ankles the same as in the lifting variation. The exercise is performed as the second exercise indicated in figure 6. The training the leg the leg is raised and crossed on the stabilizing leg with the extra force added from the resistance band, while the stabilizing leg stays on the mat. The training leg holds the position for the time indicated in Table 1.

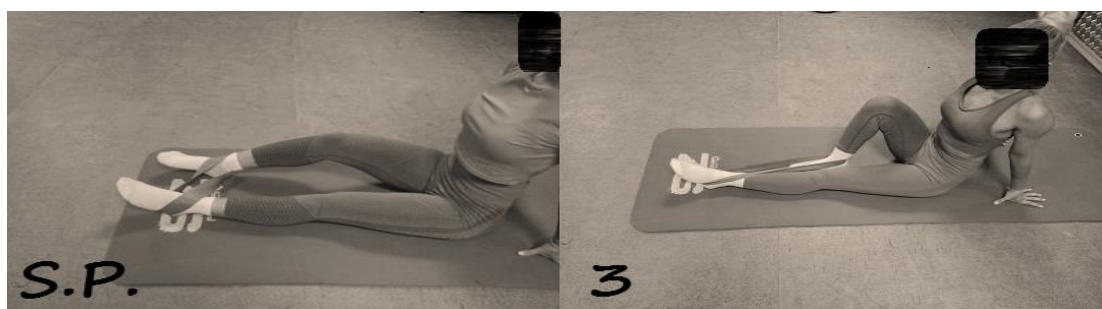


Figure 9. Exercises for the thigh with resistance band folding variation

Figure 9 presents the folding variation for exercise of the thigh with a resistance band. The starting position is the same as the previous ones. The resistance band is put on the ankles the same as in the lifting variation for the training leg and on the bottom of the leg for the stabilizing leg. The exercise is performed as the third exercise indicated in figure 6. The training leg is flexed in the knee with the extra force added from the resistance band, and the stabilizing leg stays on the mat. The training leg holds the position for the time indicated in Table 1.

DISCUSSION

The methodology covers the musculature that stabilizes the ankle and knee, which is important for the correct movement of the body, and strengthens the correct movements necessary for basketball techniques, which are proven in recent studies (Foley D., 2021). The correct execution of the described exercises will contribute to the favourable effect of isometric and resistance training with resistance bands, as confirmed by various research studies (Seththekid, 2020, Noorkõiv et al., 2015; Schott et al., 1995).

CONCLUSION

Street basketball is a variation of basketball typically played outdoors, and it's much more improvisational than traditional basketball. The most common injuries encountered in the practice of this sport are ankle sprains and knee injuries. We believe that our proposed methodology for strengthening the lower extremity will contribute to strengthening and protecting the joints and muscles for players of streetball. Future scientific research will focus on the methodology's use and the effects it has.

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