



T.C.
TOKAT GAZİOSMANPAŞA ÜNİVERSİTESİ
DEPARTMENT OF PHYSICAL EDUCATION AND SPORT

MASTER THESIS

**COMPARIOSN OF THE EFFECT OF USING RUBBER ROPES
AND MEDICINE BALLS EXERCISES IN DEVELOPING SOME
MOTOR AND PHYSICAL CHARACTERISTICS AND BASIC
SKILL IN TENNIS**

By
Sagvan Ibrahim Tahir Almahmada

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Supervised by

Prof. Dr. Yavuz Selim Ağaoğlu

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Dedication

To my great parents, who taught me to give and filled me with her tenderness and generosity.

To my dear teachers, who taught me and provided me with advice and guidance.

To my dear friends, who have not been stingy to help and support me throughout my scientific journey.

The completion of my work would not have been possible without your support.

I dedicate my research effort to you and I hope that it will satisfy you.



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ÖZET

Teniste Kauçuk İp ve Sağlık Topu Egzersizlerinin Bazı Motor ve Fiziksel Özelliklerin ve Temel Becerilerin Geliştirilmesine Etkisinin Karşılaştırılması

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Spor eğitimi, organize spor uygulama biçimlerinden biridir ve özellikle sporu başarmak için tüm fiziksel, beceri, taktik ve psikolojik yönleriyle seviyeyi geliştirme konusunda hedeflerine ulaşmada beden ve spor eğitiminin bir aracıdır. Oyuncunun bireysel ve toplu düzeyde başarı elde etmesi ve müsabaka sırasında en iyi seviyesine ulaşması için, beceri hazırlığına paralel olarak özel motor yeteneklerin kazanılması için antrenman sürecinde fiziksel hazırlığa dikkat etmesi gerekir. yetenekli performans çünkü yüksek bireysel seviyeye başlamak ve ulaşmak için sağlam bir temeldir.

Günümüzde tenisçilerin vücutlarında her zamankinden daha büyük fiziksel talepleri karşılamaları bekleniyor. Bu, oyuncuların bu talepleri karşılamak için gerekli olan fiziksel uygunluğu geliştirmek ve üzerinde çalışmak için çok daha fazla zaman harcaması gerektiği anlamına gelir. Kauçuk iplerle antrenman, vücudun belirli bölgelerinin mutlak kuvvetini geliştirmeye yardımcı olan ve beceri performansına göre, bu bölgelerin hareketlerine neden olan kuvvetleri geliştirmek için çeşitli spor faaliyetleri için bu bölgelerin hareketlerine neden olan modern antrenman yöntemlerinden biridir. Performans, zemin tenisi becerisi gibi üst ekstremiteler hareketleriyle ilgilidir.

Med Ball ve kauçuk ip egzersizlerinin teniste bazı kinetik ve fiziksel özelliklere ve temel becerilere etkisini belirlemek. kauçuk ip kullanımı ve Med Ball egzersizlerinin teniste bazı kinetik ve fiziksel özellikler ile temel beceriler üzerindeki etkisinin son testlerde karşılaştırılması önemlidir.

Çalışma örnekleme Med Ball egzersiz grubu (n = 12) ve lastik halat egzersiz grubu (n = 12) olmak üzere iki deneysel çalışma grubuna ayrılan (24) tenisçiden oluşmaktadır. Çalışma örnekleminde teniste temel becerilerin (servis, forehand ve backhand) ön testi ve ayrıca (üst uzuvlar için patlayıcı kuvvet, gövde Esnekliği, üst uzuvlar için kinetik hız, Patlayıcı güç) gibi fiziksel özelliklerin ön testi yapılmıştır. alt uzuvlar için). daha sonra iki grup haftada üç kez 8 haftalık bir antrenman programına girdiler. eğitim programı sona erdikten sonra araştırma örnekleme son testi gerçekleştirmiştir.

Med Ball egzersizleri grubu ile kauçuk halat egzersizleri grubu arasında ciddi beceri ve Med Ball egzersizleri grubu arasında anlamlı bir fark olduğunu ve ayrıca üst ekstremiteler için Patlayıcı kuvvet ve alt için patlayıcı kuvvet için her iki grup arasında anlamlı bir fark olduğunu göstermektedir.

Araştırmacı, tıbbi top ve lastik halatlar kullanarak yapılan egzersizin fiziksel uygunluk düzeyini olumlu yönde etkilediği, incelenen kauçuk halatlar ve sağlık topu ile

yapılan egzersizlerin servis ve backhand beceri performansının geliştirilmesi üzerinde olumlu bir etkiye sahip olduđu sonucuna varmıřtır.

Anahtar Kelimeler: Program Deęerlendirme, Yazılım Deęerlendirme, Kodlama Öğretimi, Çokluortam, Kullanışlılık



ABSTRACT

Comparison of the Effect of Using Rubber Ropes and Medicine Balls Exercises in Developing Some Motor and Physical Characteristics and Basic Skills in Tennis

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Sports training is one of the forms of organized sports practice, and it is a means of physical and sports education in achieving its goals, especially with regard to developing the level in all its physical, skill, tactical and psychological directions in order to achieve sports achievement at the individual and collective levels, and for the player to reach his best level during the competition, he must pay attention during the training process to physical preparation in order to acquire special motor abilities in parallel with the skill preparation, stressing the accuracy of skillful performance because it is the sound basis for starting and reaching the high individual level.

Nowadays, tennis players are expected to meet bigger physical demands on their bodies than ever before. It means that players have to spend much more time working on and improving the physical fitness necessary to meet those demands. Training with rubber ropes is one of the modern training methods that help to develop the absolute strength of specific parts of the body and according to the skill performance, in order to develop the forces that cause the movements of those parts for the various sporting activities whose performance is related to the movements of the upper extremity, such as the skill of ground tennis.

The main to identify the effect of using Med Ball and rubber ropes exercises on some kinetic and physical traits and basic skills in tennis. comparing the effect of using rubber ropes and Med Ball exercises on some kinetic and physical traits and basic skills in tennis in the post tests.

Study sample consisted of (24) tennis player divided into two experimental study groups Med Ball exercise group (n = 12) and rubber ropes exercises group (n = 12). The study sample conducted pre-test of basic skills in tennis such as (serve, forehand and backhand) and also conducted pre-test of physical characteristic such as (Explosive strength for upper limbs, Torso Flexibility, Kinetic speed for upper limbs, Explosive strength for lower limbs). and then the two groups entered a training program for 8 weeks three times in a week. after ending the training program, the research sample conducted the post-test.

the results show that there is a significant different between Med Ball exercises group and rubber ropes exercises group in sever skill and for Med Ball exercises group, and also there is a significant different between both groups in Explosive strength for upper limbs and Explosive strength for lower limbs for Med Ball exercises group, but for Torso Flexibility for rubber ropes exercises.

The researcher concluded that exercising using a med ball and rubber ropes has a positive effect on improving the level of physical fitness, the exercises using the rubber ropes and med ball under study have a positive effect on improving the skill performance of the serve and backhand skill in tennis.

Keywords: Curriculum Evaluation, Software Evaluation, Coding Education, Multimedia, Usability.



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Chapter One

1.1 Introduction:

The modern era is characterized by continuous scientific development in the field of sports activity in all the skillful, tactical, precious and physical aspects. This is due to the benefit from the results of applied research in the process of sports training and the constant search for the best ways and means to develop the level of performance of players. Thus, sports training has its main rules on which it is based and its material is derived from as a result of technological development in order to reach the athlete to high sports levels in a certain type of sport of specialized activities because it forms the basis of sport levels or sport tournaments (Aalberg, et al., 2022)

Sports training is one of the forms of organized sports practice, and it is a means of physical and sports education in achieving its goals, especially with regard to developing the level in all its physical, skill, tactical and psychological directions in order to achieve sports achievement at the individual and collective levels, and for the player to reach his best level during the competition, he must pay attention during the training process to physical preparation in order to acquire special motor abilities in parallel with the skill preparation, stressing the accuracy of skillful performance because it is the sound basis for starting and reaching the high individual level. Physical preparation is one of the most important pillars of sports training that depends on the development of the player, whether he is a beginner or an advanced player. Muscular strength is the basis on which the individual reaches the highest levels of tournaments, because it greatly affects the development of some other physical qualities such as speed, endurance and balance (Otte, et al., 2019).

Where Krebt & Abdul-Fattah (2016), and Bastawissi (2014) agree that the product of tremendous progress in various sports fields and the spread of sports competitions to achieve the best levels has emerged the importance of modern sports training science Building on science techniques, theories, and applied importance, which made it necessary to search for modern methods to develop the physical and physiological abilities and digital levels of the contestants.

In addition, Al-Beik and Abbas (2009) show that the athlete cannot optimally perform basic motor skills and cannot achieve a high level of performance perfectly without having a set of necessary motor abilities for this activity, it represents the important basis in the training process on which the completion of other training components is built, as the achievement of high levels of performance is closely related to the player's ability to achieve high levels of motor abilities specific to the type of sports activity practiced. This confirms what was indicated by Frank and Peter (1998) and Abdel-Khaleq (2003) that the development of the special motor abilities of the sports activity contributes to the player reaching the best level of performance of motor skills of the specialized activity, which the player seeks to achieve to reach the Championship positions in that activity.

Sports training using medical balls is one of the training methods used that raise the player's physical and skill level as it works to develop the player physically according to the correct skillful performance. It is important to note that one of the best sports equipment that contributes to building muscle mass is the medical ball. It is a sports exercise that began to spread three thousand years ago; Where it began with the Greek civilization and continued until this time with further development, and it contributes to building all muscle masses from different angles, in addition to its ability to improve cardiac capacity, and below we will talk about important exercises that the individual can perform with the ball to stimulate blood circulation General strengthening of the heart muscle (Rodrigo, et al., 2020).

Medicine ball training is a widely popular training modality amongst tennis players of all ages and levels. Med ball (MB) training is primarily used to augment rotational power. For a review of the underpinning science and theory on this topic, please take a look at a previous post on this topic. Why augment rotational power though? Today's game is classified as power-based - players are hitting the ball off the ball. The rationale from a training perspective is as follows: increase rotational power and you'll increase hitting speeds - whether that's groundstroke or serve speeds (Terraza-Rebollo and Baiget, 2021).

Getting more heat on a forehand or a first serve seems like a worthwhile pursuit. That said, performing MB training with inappropriate loads, half-hazard programming and poor technique likely won't help achieve these goals (and if they do, may come at a cost to the body). In this article, we'll explore Med Ball training in greater detail to see if what's currently being done, is in fact eliciting the desired outcome (Terraza-Rebollo and Baiget, 2021).

Nowadays, tennis players are expected to meet bigger physical demands on their bodies than ever before. It means that players have to spend much more time working on and improving the physical fitness necessary to meet those demands. Training with rubber ropes is one of the modern training methods that help to develop the absolute strength of specific parts of the body and according to the skill performance, in order to develop the forces that cause the movements of those parts for the various sporting activities whose performance is related to the movements of the upper extremity, such as the skill of ground tennis (Fernandez-Fernandez, et al., 2014).

The importance of the current research lies in a comparison between the effect of using rubber rope exercises and medical balls in developing some motor and physical characteristics and basic skills in the game of tennis.

1.2 State of the study:

Through the researcher's experience in Tennis as a player and coach, and his supervision of many Tennis academies, the researcher noticed that some coaches still train players in the classic and traditional ways that are recognized and that are devoid of training tools, especially rubber ropes and Med Ball from their training programs, which In turn, it helps to raise the physical and skill levels of the players, and despite

the use of rubber ropes and MED Ball in most sports in the world of Tennis training, the researcher believes that it is necessary to use rubber ropes and Med Ball, but they are very limited in training programs for ease of dealing with them, their lack of high cost, and their distinctive results in other sports. The researcher conducted this research in order to draw attention to help build training programs using the latest training tools and Med Ball, which work to attract players and raise the physical and skill level of the Tennis Players.

1.3 Research Question:

- Is there a statistically significant difference between the pre and post-test in the use of rubber ropes exercises on some physical attributes and basic skills in tennis?
- Is there a statistically significant difference between the pre-test and the post-test in the use of medical ball exercises on some physical attributes and basic skills in tennis?
- Is there a statistically significant difference in the post-test in the use of rubber ropes and medical balls exercises on some physical attributes and basic skills in tennis in the post-tests?

1.4 Research hypothesis:

- There are statistically significant differences between the pre and post-test in the use of rubber ropes exercises on some physical attributes and basic skills in tennis and in favor of the post tests.
- There are statistically significant differences between the pre and post-test in the use of medical ball exercises on some physical attributes and basic skills in tennis and in favor of the post tests.
- There are statistically significant differences in the post test in the use of rubber ropes and medical balls exercises on some physical characteristics and basic skills in tennis in the post tests.

1.5 Research objective:

To identify:

- The effect of using rubber ropes exercises on some kinetic and physical traits and basic skills in tennis.
- The effect of using Med Ball exercises on some of the kinetic and physical characteristics and basic skills in tennis.
- The effect of using rubber ropes and Med Ball exercises on some kinetic and physical traits and basic skills in tennis in the post tests

1.6 Study areas:

- Human field: Tennis Players in Duhok governate.
- Spatial domain: Sumel youth centers
- Period field: From 27/3/2022 to 30/5/2022.





Chapter Two

2. Review of literature and Previous Studies:

2.1 Review of literature

Constructive exercises are one of the most important stages of learning any skill because of their specificity, as the muscles involved in the skill work in the same direction as the required muscular work, which leads to the improvement of the neural pathways to receive and send nerve signals to and from the brain. The use of tools in general in performing exercises with various objectives is one of the psychologically exciting and physically developed factors that increase performance and practice motivation to raise the level of performance of the player and this is what has been confirmed by modern scientific research. The use of some exercises with tools that help in developing the elements of physical fitness for its practitioners, such as rubber ropes and a medicine ball has also spread recently (McGregor, 2006).

2.1.1 Rubber Robes exercises:

Rubber resistance ropes are one of the main, comfortable and effective tools that everyone can benefit from, whether they are beginners or professionals in the field of sports. Resistance ropes that target the torso area help to increase muscle mass within the entire range of motion using the strength of the resistance of the body, as well as the possibility of performing an endless variety of strength and stretching exercises in a small space (Awad, et al., 2021).

2.1.2 Medicine Ball exercises:

It is important to note that one of the best sports equipment that contributes to the development of physical qualities is the medical ball. It is a sports exercise that began to spread three thousand years ago; where it began with the Greek civilization and continued until our time with further development, and it contributes to building all muscle masses from different angles, in addition to its ability to improve cardiac capacity, and is also very suitable for all groups, abilities, ages and sports (Ford, 2005).

Also known as a training ball, medicine ball, or fitness ball, Twist (2002), it is a weighted ball with a diameter of approximately shoulder width (15-40 cm) and is often used for rehabilitation and strengthening training. The medical ball has an important role in the field of the athlete, and the medical balls are usually sold with a weight (1-11 kg) and the ball is used effectively in plyometric weightlifting to increase strength in athletes in all sports. The existence of the medicinal ball goes back to the era of Hippocrates when he said about the possibility of having stuffed animal skins for patients to throw for “medical” purposes and in Iran they used similar big balls in 1705. The term "medicine ball" dates back to at least 1876 when Robert J. Roberts was invited to establish the name in American gymnasiums and academic records and after the story of a sick king who recovered after rolling a large, herbal-filled ball (Lehman and Hoda, 2005).

It has its origins in Italy and was manufactured by a toy factory owned by the Italian Cosani Aquilino, and was used in Switzerland in the field of physiotherapy by Dr. Susan Klein, and therefore it was called the Swiss ball, and then its idea moved to San Francisco in the year 1980, and gradually it began to be used within fitness programs, and in (1991) the Swiss ball became one of the most famous fitness tools in the world and is practiced in schools (Stanton, et al., 2004).

Twist (2004) points out that exercising with a Swiss or functional ball has many benefits, including that performing exercises on a rubber ball increases resistance on working muscles such as abdominal muscles, back and others. Its benefits also control and strengthen the working muscles and improve the internal stability and internal strength of all kinds for the individual, as it facilitates the performance of exercises on them, and the latter is used in the treatment of some deformities of posture. They actually use it for students to sit on to improve posture and stature.

Craig (2006) adds that sports scientists at the University of San Diego have agreed that exercise with the Swiss ball works to strengthen the abdominal and back muscles as a result of increased resistance, in addition to that it contributes to improving the health aspect, as it is used as one of the means of natural treatment to relieve lower back pain and rehabilitation after injury and to treat Neuromuscular patients, it is an important tool for developing strength, increasing flexibility and improving both balance and coordination.

2.1.3 Tennis Sport:

Tennis is defined as a sport played collectively by two competing teams of players each or individually by two players playing against each other. The game is based on one of the players or two teams using a racket with specific specifications to hit a ball of a specific size, and passing this ball over a network of the game in order to put it and deliver it to the part of the court of the team or the opposing player who must turn move to return the ball and prevent it from touching His own part of the playing field, in order to avoid calculating points for the opponent (Faraj, 2008). It should be noted that tennis is played according to specific and clear rules set by the International Tennis Federation (ITF).

2.1.3.1 Basic Skills in Tennis:

Tennis has many types of strikes with which the ball is hit during play, and the ease and difficulty of those strikes vary depending on the different abilities of the players.

1. Serve:

The serve kick in tennis is one of the important strikes in the tennis ball game, as it is one of the difficult strikes because it needs control and mastery so that the sender can save it, because after the success of the hit a point can be scored. In order for

the player to score a point in the serve, he must master this hit of all kinds, where he can hit the serve and make the ball rotate in different directions, also at different speeds and with the strong force, and the effective serve by the player enables him to win the game. Joey and Scott (2011) determined the four main methods that must be followed when teaching or teaching the serve, which are:

- Standing
- Swinging
- Throwing
- Hitting

The serve was not previously important as it is a way to start playing, and therefore the player's interest when performing it was to conform to the law of the game only, that is, he was sending in the manner of a raised kick with the aim of crossing the ball over the net and falling in the area of the service. But we see now that with the growth of the game and its progress, the serve has developed and diversified, and it has offensive strikes aimed at winning a point. It is also possible to win the match when the transmission is fast and accurate, and the transmission usually seems easy to perform, but in fact, the player needs long hours of training to reach a good level of performance, and the transmission needs neuromuscular coordination in addition to the speed of movement in order to be successful. The player must keep in mind that the most important point in serving is the correct throwing of the ball. It should therefore be noted that the ball-tossing action is always performed at the end of the backswing phase. The ball is thrown upwards to the appropriate height at which we should hit. The direction of the ball is different for each type of service. Before explaining the different types of transmission, it is necessary to clarify the importance of preparing for the performance of the transmission (Joey and Scott, 2011). The standby stands in all types are the same. The most appropriate place to stand is in the middle of the baseline, where the player can direct the transmission from this place well, whether it is straight or diagonal, that is, to the inner and outer corners of the transmission area, and the left side of the body goes to the net and the left foot works with the baseline, an angle of approximately (45). The right foot has rested a step behind the left foot, so that when an imaginary line is drawn in the middle of the space between the feet, it reaches the point at which the player aims to direct his serve, and distributes the weight of the body on the feet equally (Faraj, 2007). The front leg is slightly bent and the back leg is more bent. The greater weight of the body is on the back foot with the body bent to the right side while directing the top of the racket to the opponent, and the left-hand catch the ball that will be sent.

A. Straight serve (direct): The stages of this type of service are:

- The stage of the back swing and the throwing of the ball: in which the right arm is bent slightly and swung backward until shoulder height, and at the same time the other left arm holding the ball is raised up with the elbow joint bent until almost a right angle, and the weight of the body is located on the right back foot, and the knees are slightly bent The ball is held with the fingertips of the left hand, and while

the left-hand reaches at the height of the shoulders, the ball is thrown or pushed vertically upwards without turning (Faraj, 2007).

- The stage of hitting and touching the ball: in which the correct height of the ball is the point where it can meet the middle of the racket strings when the right arm is fully extended up, and at this point the ball will be stationary at the moment of hitting it, and the hand leaves the ball while it is about the height of the head, and at the same time, it moves. The arm striking up at an angle with the body arching back slightly. This is the first stage of the movement. With slight pressure from the right foot, the body straightens out and moves its weight forward on the instep of the left foot, with the arm extended up to touch the ball at the highest possible point, and the right foot is slightly raised from the ground, and this is the second stage of the movement (Woods, 2014).
- Follow-up stage: After finishing hitting the ball, the striking arm moves slightly in front of the body, and the right foot is moved forward while stopping the movement of the body from rushing forward as an extension of the movement (Woods, 2014).

2. Forehand:

The front kick means hitting the ball in front of the player or on the side of the arm in which he is playing. Recently, the forehand has become an effective offensive weapon, and its effectiveness is not only by the amount of forcing the player hits but how to use it and its direction, as it depends on a special force according to the conditions of play. The forehand is one of the most commonly used tennis strokes, and it is easy to learn because the ball is hit from the right side of the body. It is the main attacking blow in the match (Woods, 2014). In light of the previous basics and for good performance, you must take into account:

1. Early preparation and sufficient opportunity to swing back.
2. The ball dropped from the highest bounce is encouraged by the correct pass of the head of the racket.
3. The effective weighting of the head of the racket is achieved only by taking the correct hitting position and the point of contact of the ball (Woods, 2014).

Forehand kicks are considered one of the most familiar and most common groundstrokes in tennis, and they are also easy to perform in comparison to other strikes. Therefore, the player must learn it well and control it before starting to learn any other strokes (Grasso, 2011). It is noted that all the movements that are displayed are for the right-handed player. And the left player has to perform the opposite of these movements (Faraj, 2007). The technical stages of performance can be summarized in the following points:

1. Starting from the standby position and early in the back swing.
2. The connection between the rear sway and the front sway smoothly.
3. Prepare the racket with the right leg and then take a step forward with the left leg.
4. Hit the ball at the level of the pelvis and the appropriate height and distance from the body.

5. Continue by hitting so that the racket is at the height of the head and the top of the body, facing the net.
6. Maintain balance during the performance.
7. Reversion to the standby mode (González-González, et al., 2018).

4. Backhand:

There are two common types of backhand one-handed two hands. Backhand means hitting the ball from the opposite side of the player (Grasso, 2011). And the backhand kick is more difficult than the forehand, because it is used to play the balls from the left side of the body, and the mechanics of performing the kick as in the case of the forehand. In light of the previous basics, the multiplication area and the focal point are related to three dimensions:

- A. The ball is hit at a height between the knee and the middle.
- B. The ball is hit from the side and in front of the body with a slight deviation.
- C. The ball is hit at a distance from the body. The technical stages of performance are as follows:
 1. From the standby position, the first changes and the position of the body changes.
 2. Prepare early to hit the ball and catch the hand or both hands, but take care not to rotate the shoulder as much as using one hand.
 3. Prepare with the left leg and take a step with the right leg before performing.
 4. Time of the swing back before the ball rebounds. Contact the ball early.
 5. Hitting and fist with two hands or leaving the free hand after hitting (such as Jimmy Konzer).
 6. Follow up with the hands and hit at the level of the head and the top of the body, facing the net.

There are two types of racket catch:

- A. The right hand is a normal fist and the left is an oriental fist.
- B. The right hand is an eastern fist like the forehand, and the left hand is also an eastern fist (González-González, et al., 2018).

2.1.3.2 Fitness components for Tennis Player

Tennis sport requires a high physical fitness level, and the player must be characterized by high functional adequacy of an efficient heart ability to pump large amounts of blood to all the muscles and working tissues of the body, and strong lungs that are able to feed all the muscles of the body with oxygen during the long hours that will take place during the match, in addition to great strength in the legs and arms, transitional speed and endurance, all of these qualities are necessary for a good player (Jawad, 2002).

Physical fitness is the way to reach the top in tennis, and therefore the coach must prepare his players to the level of maximum endurance in order to enable them to continue playing the total match or participate in the league effectively, and usually players with high fitness are able to strike stronger and move quickly on their

opponents They are also able to recover faster between games, and have the best chance of getting the ball and returning it effectively. In racket games, they are characterized by special elements of motor abilities to perform skillfully on a small area compared to other sports, which require high speed and accuracy (Faraj and Fikri, 2002), as they are characterized by high and fast sudden movements such as jumping and spinning of the racket.

1. Explosive strength:

Strength is one of the important elements in the game of tennis, especially since all the strikes of the game movement of the transmission and the smash hit, which need a great force to hit the ball and a great force to stop the racket, where we note here that the importance of the explosive force of the muscles of the arms lies in overcoming the resistance resulting from the weight of the racket in addition to achieving the goal It is to achieve and produce maximum force in the least possible time, especially in some basic strikes such as sending and pressing. These blows are performed with maximum muscle tension to produce the largest force of this muscle contraction and in the shortest period of time, or the production of this force is only once based on its definition by many scientists and researchers, as defined by (Mahjoub, et al., 2000) as “the highest The strength that an athlete obtains in the least amount of time and for one time. Generating explosive power in the arms is extremely important to a tennis player when performing all the skills that require explosive power to win a point. It also highlights the importance of the explosive force of the muscles of the legs in overcoming the resistance resulting from the field of play of all kinds, as well as the resistance resulting from the weight of the body (Bin-Zaini and Pitil, 2017).

Regarding the importance of explosive power, (Barrow and Maggie) mentioned that most successful athletes possess a great deal of strength and speed and have the ability to link these two characteristics in an integrated manner to explosive force events in order to achieve better performance (Alawi and Abdel Fattah, 2000). Therefore, the explosive power of the muscles of the arms and legs is one of the important qualities that the tennis player needs because of the skills that this game is characterized by that requires the generation of explosive force to perform these skills, and the explosive force is linked to the element of strength, which is one of the important means that plays an important role in raising the physical level of the tennis player. As the player works to produce this force to counter the resistance resulting from the weight of the player and the weight of the racket (Shawkat et al., 1990).

2. Flexibility:

Flexibility is one of the important physical abilities in tennis according to the many variables in the muscular work that occurs during play. If the player needs to

lengthen all the muscles of the body in order to prepare them to work before the muscles of the legs, thighs, trunk, chest, shoulders, arms and wrists. Flexibility is one of the elements of special physical preparation in tennis, which plays a major role in reaching higher levels. On the contrary, the lack of flexibility prevents tennis players from moving effectively, which affects the proper execution of strikes and flexibility training is one of the most important strategies that are used to prevent the injury is generally in the lower back area. The researcher agrees with Faraj (2015) that stretching exercises help reduce or prevent injuries to muscle tissue, tendons and ligaments in tennis players, where flexibility improves through muscle stretching exercises, and tennis players need flexibility to maintain the full range of joint movement in all parts of the body. So, the tennis player must easily bend, twist and stretch his body right, left, forward and up, and good flexibility confirms this and usually some players are more flexible than others.

3. Speed:

Speed is one of the main factors of physical performance, which is related to the sequence of muscle contraction during motor performance, and it is an essential component of most sports activities, especially related to the time of motor performance, and speed affects all other physical components, as it is related to muscle strength in what is known as ability. Various activities, and speed is one of the important pillars to reach high sports levels, and it is no less important than muscular strength, with evidence that there is no battery for testing to measure the level of general fitness except that it contains speed tests, Abdel-Khaleq (2003) states that speed is one of the important components of physical fitness and is an essential component of most sports activities, especially those related to the time of motor performance. The shortest possible time, it has been confirms that the speed factor is one of the factors that clearly and effectively affects the performance of all tennis sports skills in terms of the motor performance of the basic and advanced strikes, as well as the transition from the defense state to the attack state and from the attack hall to the defense state (Faraj, 2015). In tennis, the kinetic speed plays an important role when swinging the racket in preparation for hitting the ball (Al-Khouli and Al-Shafei, 2001).

2.2 Previous Studies:

2.2.1 Abu Shehab study (2018).

Study title: The effect of a proposed training program using rubber ropes to improve the level of skill performance among junior footballers.

This study aimed: to identify the effect of a proposed training program using rubber ropes for players to improve the level of skill performance among junior footballers.

Research sample: The study sample consisted of (30) players divided into two equal groups (15) in each group, they were selected intentionally from Al-Faisaly Club Academy / Karak.

Research Methodology: The experimental method was used for its suitability to the nature and objectives of the study.

Statistical methods: The t-test for independent samples was used to detect the differences between the control and experimental groups, and the Wilcoxon test for linked samples to reveal the differences between the pre- and post-test measurement of the experimental group.

Conclusions: The results showed that there were statistically significant differences at the significance level (0.05) in the dimensional measurements of improving skill performance between the experimental and control groups and in favor of the experimental group among football juniors.

2.2.2 Al-Labbani Study (2020).

Study title: The effect of plyometric training on transmission speed and the development of physical performance in tennis

This study aimed:

Detection of the effect of plyometric training on the speed and accuracy of transmission in tennis and some capabilities affecting performance

The research sample: The research sample consisted of (20) female students who were randomly divided into two groups, one of them is experimental (n = 10) and the other is control (n = 10) female students.

Research Methodology: The researcher used the experimental method by using the tribal and remote measurements for two groups, one experimental and the other control, due to its suitability to the nature of the research.

Conclusions:

The proposed plyometric exercises had a positive effect on the speed and accuracy of the serve in tennis

for the experimental group. And the proposed plyometric exercises led to a significant improvement in physical performance, for example, the muscular ability of the arms and legs - agility - reaction speed - transitional speed in tennis for the experimental group.

Chapter Three

3. Methodology and Procedures:

3.1 Research Methodology:

An experimental approach has been used to conduct the data for the study.

3.2 The population and sampling:

The study community consisted of 35 tennis player form Sumel youth center and the study sample consisted of (24) youth tennis player as the demographic variables shows in the table (1). The sample of study divided into two experimental study groups Med Ball exercise group (n = 12) and rubber ropes exercises group (n = 12).

3.3 Instruments of data collection:

The data for the study were collected using:

- Questionnaires
- Interviews
- Observational checklists
- Internet sources.

3.4 Questionnaire:

3.4.1 Questionnaire form for the physical characteristics of tennis players

To choose the most important physical characteristics of tennis players, a questionnaire form (Appendix1) was prepared by the researcher, which included a set of the most physical characteristics of tennis players, and it was presented to a group of experienced and specialized in the field of tennis and sports training, and their names are listed in (Appendix 7) on Sunday 13/2/2022.

3.4.2 Questionnaire form for basic skills in tennis

For choosing the most important basic skills in tennis, a questionnaire form (Appendix 2) was prepared by the researcher, which included a set of the most important tennis basic skills, and it was presented to a group of experienced and specialized in the field of tennis and sports training, and their names are listed in (Appendix 7) on Sunday 13/2/2022.

3.4.3 Questionnaire form for physical characteristics tests

For selecting the most important physical characteristics tests for tennis players, a questionnaire form (Appendix 3) was prepared by the researcher, which included a set of the physical characteristics tests for tennis players, and it was presented to a group of experienced and specialized in the field of tennis and sports training, and their names are listed in (Appendix 7) on Sunday 27/2/2022.

3.4.4 Questionnaire form for basic skills tests in tennis

For choosing the most important basic skills tests in tennis, a questionnaire form (Appendix 4) was prepared by the researcher, which included a set of the most important basic skills tests, and it was presented to a group of experienced and specialized in the field of tennis and sports training, and their names are listed in (Appendix 7) on Sunday 27/2/2022.

3.4.5 Questionnaire form for a training curriculum of medical balls exercises

To determine the most important exercises with medical balls, a questionnaire form (Appendix 5) was prepared by the researcher, which included a set of exercises with medical balls, and it was presented to a group of experienced and specialized in the field of tennis and sports training, and their names are listed in (Appendix 7) on Monday 7/3/2021.

3.4.6 Questionnaire form for a training syllabus of rubber ropes exercises

To select the most important exercises with rubber ropes exercises, a questionnaire form (Appendix 6) was prepared by the researcher, which included a set of exercises with rubber ropes, and it was presented to a group of experienced and specialized in the field of tennis and sports training, and their names are listed in (Appendix 7) on Monday 7/3/2021.

3.5 Study tests:

3.5.1 Physical tests:

3.5.1.1 Explosive strength for upper limbs

- Test title: pushing a medicine ball weighing (1) kg with one arm from shoulder level
- Purpose of the test: To measure the explosive force of the arm.
- Test tools: a flat space, a medicine ball weighing 1 kg, a tape measure, and a colored sticky tape
- Test Performance:
The place of the throw is planned by parallel lines and the distance between each line is 5 cm, or the measuring tape is fixed on the starting line from zero to a few meters toward the throwing area. The tester stands behind the starting line facing the throwing line, holding the ball with one hand above the shoulder, and then pushing the ball as far as shown in Figure (1).
- The conditions:
The player has to push the ball over a level.
The push should be towards the throwing area.
Each player has two attempts to calculate the best one.



Figure 1: Explosive strength for upper limbs

3.5.1.2 Torso Flexibility

- Test title: Sitting longitudinal torso flexion forward test
- Purpose of test: torso flexibility measurement
- Test Equipment required: Box, tape measurement.
- Test procedure: The tester sits in front of the box in a sitting position at length with the arms and palms straight in front to reach the farthest range of movement of the torso with the feet fixed joined and fully extended and fixed to the front wall of the box from the front.
- Scoring: The distance achieved by the laboratory was recorded in centimeters in the two trials, and the longer distance was calculated for it, Figure (2).



Figure 2: Sitting longitudinal torso flexion forward test

3.5.1.3 Kinetic speed for upper limbs

- Test title: Arm rotation speed test around a basket
- The purpose of the test: to measure the kinematic speed of the arm
- Tools: stopwatch, basket
- Test Specifications:

The tester stands next to the basket. When he hears the start signal, he makes circles with the arm, provided that the hand is aligned with the top of the basket during the performance, and the laboratory repeats the work of the circles to the largest possible number in twenty seconds.
- Test record:

A record for the tester is the number of circuits it performs in twenty seconds

Figure (3)



Figure 3: Kinetic speed for upper limbs

3.5.1.4 Explosive strength for lower limbs

- Test title: Broad jump test, also called standing long jump test
- Aim of test: to measure explosive leg strength
- Test Equipment required: tape measure for measuring distance jumped, non-slip surface for take-off, and soft-landing area preferred.
- Test procedure: The participant stands behind a line marked on the ground with feet slightly apart. A two-foot take-off and landing are used, with the swinging of the arms and bending of the knees to provide forward drive. The participant tries to jump as far as possible, landing on both feet without falling backward. Three attempts are allowed
- Scoring: The measurement is taken from the take-off line to the nearest point of contact on the landing (back of the heels). Record the longest distance jumped, the best of three attempts, as shown in Fig (4)

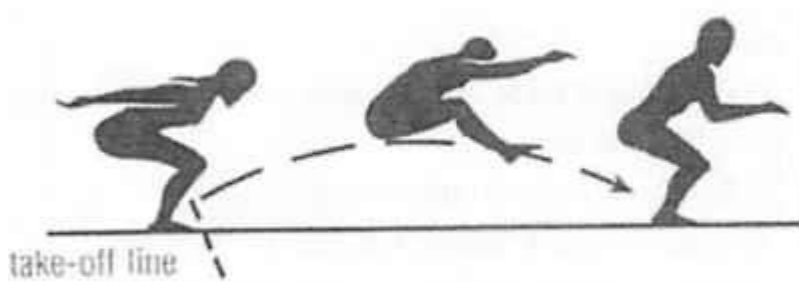


Figure 4: Explosive strength for lower limbs

3.5.2 Skillful tests:

3.5.2.1 Forehand test

- Test name: Forehand test to divided area
- The purpose of the test: Forehand groundstroke measurement
- Test tools:
 - Tennis court, it can be divided into zones (A - D - C - B) as shown in the test diagram (Figure, .
 - 20 tennis balls
 - 12 tennis rackets
 - colored adhesive tape
 - tape measure
 - registration form
- Test instructions:
 - The player stands on the base line and on the center mark and is not allowed to cross it.
 - The scorer stands on the opposite court to calculate the scores for the correct balls.
 - The assistant collects the balls with the help of the teacher.
 - The player gives two trial attempts to warm up and conditioning on the test.
 - The player is awarded (10) attempts to hit the forehand.
- Test description:

The tester throws the ball on the ground and when it bounces up he plays it with a forehand kick to the opposite court trying to drop it at the end of the court

- Scoring:
 1. Scores for each correct ball are calculated as follows:
 - (4) points for the fallen ball in area (A).
 - (3) points for a fallen ball area (B).
 - (2) points for the fallen ball in area (C).
 - (1) points for the fallen ball. area (D).
 - (zero) points balls that do not cross the net or fall outside the individual court.
 2. The total score of the player is the sum of the scores scored in the ten attempts
 3. The total score of the test is (40) marks. Figure (5)

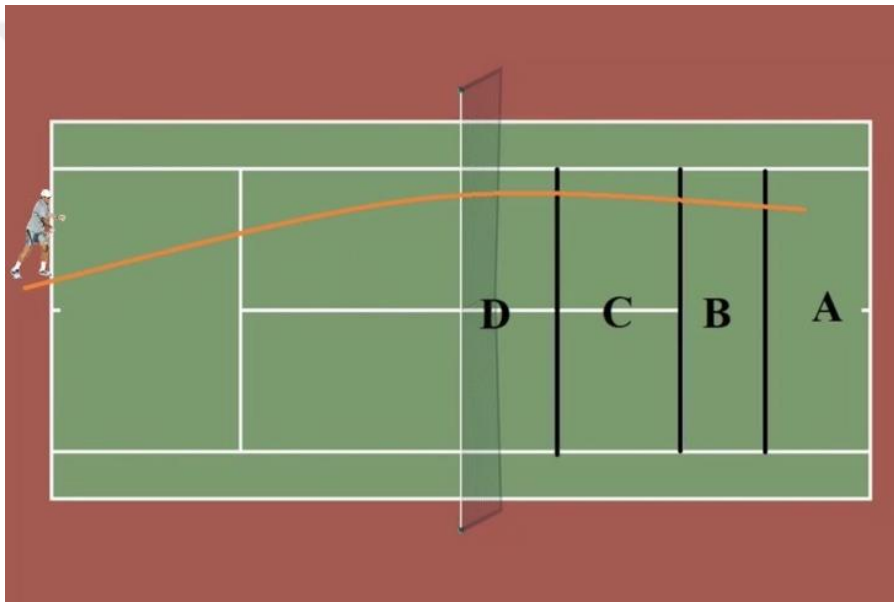


Figure 5: Forehand test to divided area

3.5.2.2 Backhand test:

- Test name: Backhand test
- The purpose of the test: backhand groundstroke measurement
- Test tools:
 - Tennis court, it can be divided into zones (A - D - C - B) as shown in the test diagram (Figer, .
 - 20 tennis balls
 - 12 tennis rackets
 - colored adhesive tape
 - tape measure
 - registration form

- Test instructions:
 - The player stands on the base line and on the center mark and is not allowed to cross it.
 - The scorer stands on the opposite court to calculate the scores for the correct balls.
 - The assistant collects the balls with the help of the teacher.
 - The player gives two trial attempts to warm up and conditioning on the test.
 - The player is awarded (10) attempts to hit the forehand.
- Test description:

The tester throws the ball on the ground and when it bounces up he plays it with a forehand kick to the opposite court trying to drop it at the end of the court
- Scoring:
 4. Scores for each correct ball are calculated as follows:
 - (4) points for the fallen ball in area (A).
 - (3) points for a fallen ball area (B).
 - (2) points for the fallen ball in area (C).
 - (1) points for the fallen ball. area (D).
 - (zero) points balls that do not cross the net or fall outside the individual court.
 5. The total score of the player is the sum of the scores scored in the ten attempts
 6. The total score of the test is (40) marks. Figure (6)

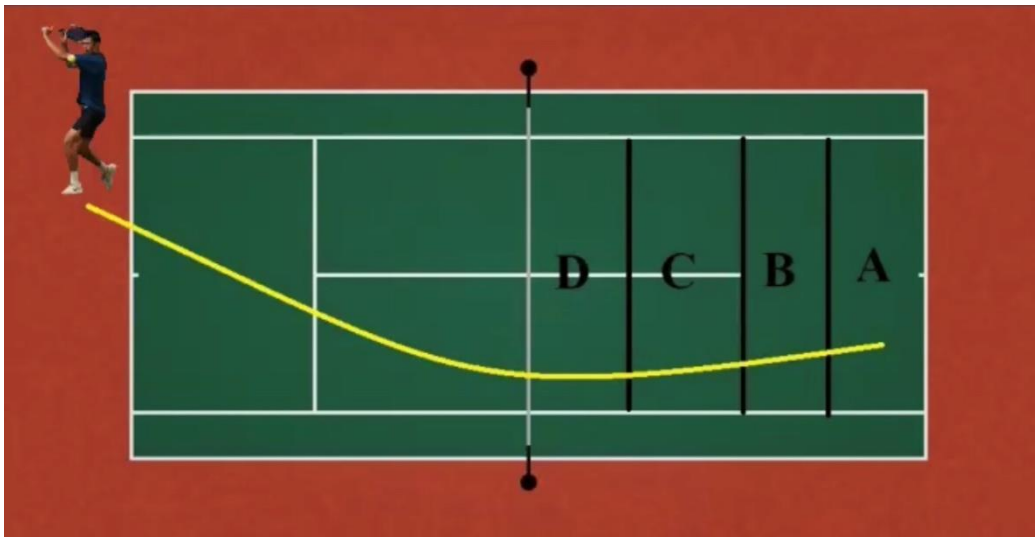


Figure 6: Backhand test

3.5.2.3 Serve test

- Test name: White's modified service accuracy test in tennis:
- The purpose of the test: To measure the accuracy of the serve in tennis
- Test tools:
 - Tennis court
 - 20 tennis balls
 - 12 tennis rackets
 - colored adhesive tape
 - tape measure
 - Rope
 - registration form
- Test description:
 - A rope is fixed from its two ends to the poles of the net from the top, as the distance between the net and the rope is 4 feet, and it is noticed that the rope is taut.
 - The transmission region is divided into six regions, shown in Figure (1) and numbered 1, 2, 3, 4, 5, and 6, where these numbers refer to the degrees of that region:
 - The number (1) refers to a rectangle (15 x 13.5) feet
 - The number (2) refers to a rectangle (6 x 10.6) feet
 - The numbers (3, 4, 5, and 6) refer to rectangles 1. Their dimensions are (5 x 3.5) feet
 - The same numbers (1,2,3,4,5,6) indicate the scores assigned to each of the areas on which the ball falls when serving, provided that it passes between the net and the rope.
 - The test is explained to the testers and a model is made before the application
 - A warm-up period of no less than 10 minutes is given to the testers on the tennis court.
- Test conditions:
 - The player stands behind the baseline and performs and tries to make 10 attempts
 - An attempt is considered successful if the ball crosses between the rope and the net and falls into the service area.
 - Retry if the ball touches the net and falls inside the service area, and also if the ball touches the rope and falls inside the service area
 - 2 trial attempts are given to the player.
 - The laboratory score is calculated if it falls within the transmission area.
 - The player's total score is the sum of the scores of ten attempts (60) Figure (7)

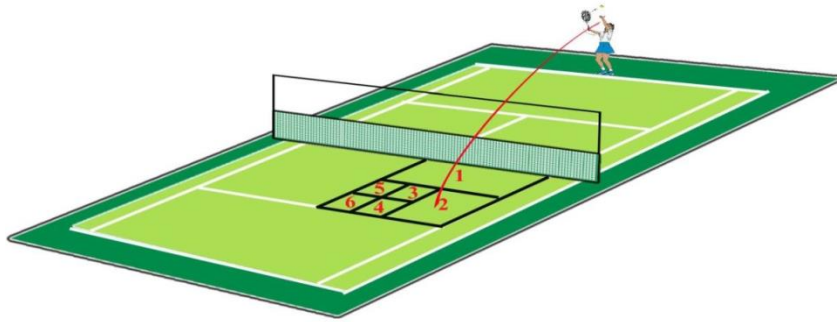


Figure 7:

White's modified service accuracy test in tennis

3.6 Equipment and tools used in the research

- Tennis rackets
- Tennis balls
- Tape measurement
- Stop watch
- Stadiometer
- Digital Body Scales
- Colorful tape stickers
- Med. Balls
- Rubber robs

3.7 Pilot experiments

Before conducting the study training programs and all required tests, researcher did pilot tests for checking the validity of tools and to see the obstacles those will face the research process, also to ensure that the study sample are familiar with study tests, finally to look out how long the test procedures will take.

3.8 Study Tests

3.8.1 Study pre-tests:

The researcher conducted the physical tests (med ball throw, long jump, flexibility, and kinetic speed) and also, skillful tests (serve, forehand, and backhand) per-test for the study sample for both groups on Monday (27/3/2022), where the per-tests were relied on as an arbitrator for the post-test.

3.8.2 Study post-tests:

After the completion of the experimental program, the researchers conducted the post-tests on study sample for both groups on Monday (30/5/2022)

3.9 Training programs

3.9.1 Training program for rubber ropes exercise group

Through the researcher's briefing on the previous studies and research conducted in this field, as well as browsing the websites, a training program for rubber ropes exercise was prepared and a sample of it was presented to some experts and specialists, for a period of 8 weeks, with three training sessions per week, where the time of the training unit was 90 minutes figure (8). The implementation of Training program for rubber ropes exercise group was started from 3/4/2022 to 26/5/2022



Figure 8: Training program for rubber ropes exercise group

3.9.2 Training program Med Ball exercise group

Through the researcher's briefing on the previous studies and research conducted in this field, as well as browsing the websites, a training program for Med Ball exercise was prepared and a sample of it was presented to some experts and specialists, for a period of 8 weeks, with three training sessions per week, where the time of the training unit was 90 minutes. The implementation of Training program for Med Ball exercise group was started from 3/4/2022 to 26/5/2022.

3.10 Statistical Analysis

- Mean
- Standard deviation
- Independent sample t test
- Paired sample t test
- Percentage

Chapter Four

4. Results and Discussion:

1 Results

Table 1: Results of demographic Variables.

Variables	Rubber Ropes exercise group		Med Ball exercise group	
	Mean	SD	mean	SD
Age / year	19.75	0.97	19.83	1.16
Weight / Kg	73.68	6.37	74.67	4.95
Height / cm	179.33	3.49	176.17	4.85

The results of table (1) show the mean and SD of study samples, where for age variable for Rubber Ropes group is (19.75 ± 0.97) years old and for Med Ball group is (19.83 ± 1.16) years old, as for body mass for Rubber Ropes group is (73.68 ± 6.37) Kg, for Med Ball group is (74.67 ± 4.95) Kg, finally for body height for Rubber Ropes group is (179.33 ± 3.49) cm and for Med Ball group is (176.8317 ± 4.85) cm.

Table 2: Comparing the results of Pre-test between groups

Variables	Rubber Ropes exercise group N = 12		Med Ball exercise group N = 12		sig
	mean	SD	mean	SD	
Backhand / points	25.5	3.73	26.42	3.67	3.46
Forehand / points	28.75	3.24	28.83	3.01	9.65
Serve / points	31.33	4.16	30.5	5.66	3.45
Throw Med Ball / m	6.37	0.62	6.23	0.66	2.64
Board jump / m	2.26	0.09	2.31	0.31	3.41
Dynamic Seep / rep	21.5	2.73	21.83	2.14	6.53
Torso flexibility / cm	29.25	4.85	29.42	4.69	2.74

- Significant level is p value ≤ 0.05

Table (2) shows the results of pre-test between both study groups, where in basic skill there is no significant differences between both groups in Backhand skill, Rubber Ropes group is (25.5 ± 3.73) points and for Med Ball group is (26.42 ± 3.67) points ($P = 3.46$), for Forehand skills Rubber Ropes group is (28.75 ± 3.24) points and for Med Ball group is (28.83 ± 3.01) points ($P = 9.65$), as for Serve Rubber Ropes group is (31.33 ± 4.16) points and for Med Ball group is (30.5 ± 5.66) points ($P = 3.45$). Also, for the main physical characteristics there is no significant differences between both groups, where for explosive strength for hands the throw med ball test show no significant differences between both groups Rubber Ropes group is (6.37 ± 0.62) meters and for Med Ball group is (6.23 ± 0.66) meters ($P = 2.64$), for explosive strength

for legs the results of board jump test show no significant differences between both groups Rubber Ropes group is (2.26 ± 0.09) meters and for Med Ball group is (2.31 ± 0.31) meters ($P = 3.41$), for kinetic speed of the hand the results of dynamic Seep of upper limbs test show no significant differences between both groups Rubber Ropes group is (21.5 ± 2.73) repetition and for Med Ball group is (21.83 ± 2.14) repetition ($P = 6.53$), same for Torso flexibility the results of Sitting longitudinal torso flexion forward test show no significant differences between both groups Rubber Ropes group is (29.25 ± 4.85) cm and for Med Ball group is (29.42 ± 4.69) cm ($P = 2.74$).

Table 3: Comparing the results of Rubber Ropes exercise group between pre and post tests.

Variables	Pre test		Post test		sig
	mean	SD	mean	SD	
Backhand / points	25.5	3.73	29.25	3.35	0.03
Forehand / points	28.75	3.24	30.33	2.33	0.12
Serve / points	31.33	4.16	41.16	3.87	0.01
Throw Med Ball / m	6.37	0.62	7	0.24	0.05
Board jump / m	2.26	0.09	2.33	0.06	1.35
Dynamic Seep / rep	21.5	2.73	23.92	1.21	0.12
Torso flexibility / cm	29.25	4.85	41.42	3.47	0.01

- Significant level is p value ≤ 0.05

Table (3) presents the comparison between pre-test and post-test of Rubber Ropes exercise group, where in basic skill there is significant differences between both pre-test and post-test in Backhand skill, pre-test is (25.5 ± 3.73) points and for post-test is (29.25 ± 3.35) points ($P = 0.03$), as for Serve pre-test is (31.33 ± 4.16) points and for post-test is (41.16 ± 3.87) points ($P = 0.01$), but for Forehand skills there is no significant differences between pre-test is (28.75 ± 3.24) points and for post-test is (30.33 ± 2.33) points ($P = 0.12$). Also, for the main physical characteristics the throw med ball test shows significant differences between pre-test and post-test, where pre-test is (6.37 ± 0.62) meters and for post-test is (7 ± 0.24) meters ($P = 0.05$), same for Torso flexibility the results of Sitting longitudinal torso flexion forward test shows significant differences between pre-test and post-test, where pre-test (29.25 ± 4.85) cm and for post-test is (41.42 ± 3.47) cm ($P = 0.01$). However, for explosive strength for legs the results of board jump test show no significant differences between pre-test and post-test, where for pre-test is (2.26 ± 0.09) meters and for post-test is (2.33 ± 0.06) meters ($P = 1.35$), same for kinetic speed of the hand the results of dynamic Seep of upper limbs test shows no significant differences between both tests, where for pre-test is (21.5 ± 2.73) repetition and for post-test is (23.92 ± 1.21) repetition ($P = 0.12$),

Table 4: Comparing the results of Med Ball exercise group between pre and post tests

Variables	Pre test		Post test		sig
	mean	SD	mean	SD	
Backhand / points	26.42	3.67	29.42	2.62	0.03
Forehand / points	28.83	3.01	31	2.15	0.09
Serve / points	30.5	5.66	45.29	3.64	0.01
Throw Med Ball / m	6.23	0.66	11.56	4.62	0.01
Board jump / m	2.31	0.31	2.40	0.28	1.34
Dynamic Seep / rep	21.83	2.14	23.83	1.41	0.08
Torso flexibility / cm	29.42	4.69	35.67	1.72	0.04

- Significant level is $p \text{ value} \leq 0.05$

Table (3) presents the comparison between pre-test and post-test of Med Ball exercise group, where in basic skill there is significant differences between both pre-test and post-test in Backhand skill, pre-test is (26.42 ± 3.67) points and for post-test is (29.42 ± 2.62) points ($P = 0.03$), as for Serve pre-test is (30.5 ± 5.66) points and for post-test is (45.29 ± 3.64) points ($P = 0.01$), but for Forehand skills there is no significant differences between pre-test is (28.83 ± 3.01) points and for post-test is (31 ± 2.15) points ($P = 0.09$). Also, for the main physical characteristics the throw med ball test shows significant differences between pre-test and post-test, where pre-test is (6.37 ± 0.66) meters and for post-test is (11.56 ± 4.62) meters ($P = 0.01$), same for Torso flexibility the results of Sitting longitudinal torso flexion forward test shows significant differences between pre-test and post-test, where pre-test (29.42 ± 4.69) cm and for post-test is (35.67 ± 1.72) cm ($P = 0.04$). However, for explosive strength for legs the results of board jump test show no significant differences between pre-test and post-test, where for pre-test is (2.31 ± 0.31) meters and for post-test is (2.40 ± 0.28) meters ($P = 1.34$), same for kinetic speed of the hand the results of dynamic Seep of upper limbs test shows no significant differences between both tests, where for pre-test is (21.83 ± 2.14) repetition and for post-test is (23.83 ± 1.41) repetition ($P = 0.08$),

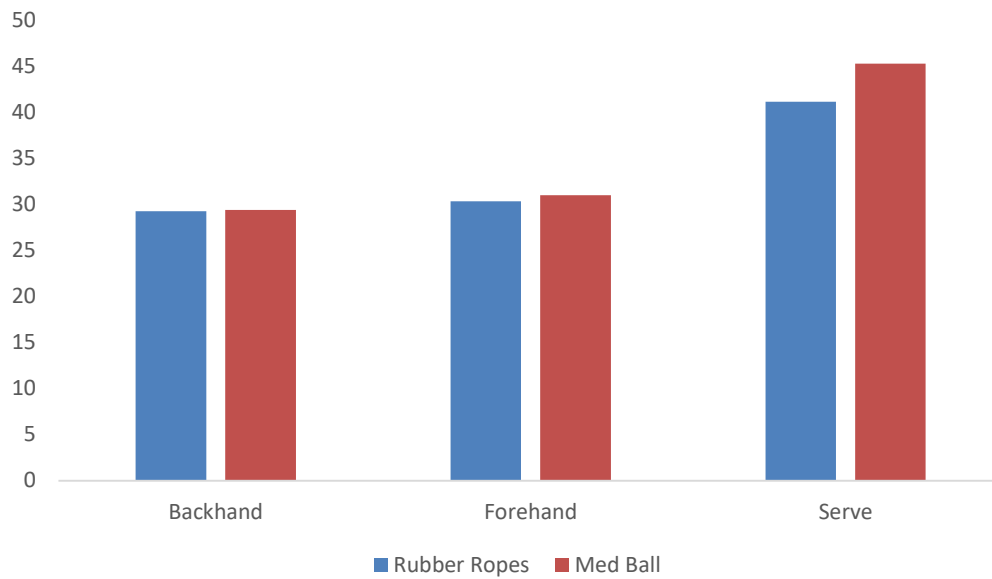
Table 5: Comparing the results of Post-test between groups

Variables	Rubber Ropes exercise group N = 12		Med Ball exercise group N = 12		sig
	mean	SD	mean	SD	
Backhand / points	29.25	3.35	29.42	2.62	4.35
Forehand / points	30.33	2.33	31	2.15	3.56
Serve / points	41.16	3.87	45.29	3.64	0.03
Throw Med Ball / m	7	0.24	11.56	4.62	0.01
Board jump / m	2.33	0.06	2.40	0.28	0.01
Dynamic Seep / rep	23.92	1.21	23.83	1.41	5.64
Torso flexibility / cm	41.42	3.47	35.67	1.72	0.01

- Significant level is p value ≤ 0.05

Table (5) shows the results of post-test between both study groups, where in basic skill there is no significant differences between both groups in Backhand skill, Rubber Ropes group is (29.25 ± 3.35) points and for Med Ball group is (29.42 ± 2.62) points ($P = 4.35$), for Forehand skills Rubber Ropes group is (30.33 ± 2.33) points and for Med Ball group is (31 ± 2.15) points ($P = 3.56$), but for Serve there is significant differences between both groups, Rubber Ropes group is (41.16 ± 3.87) points and for Med Ball group is (45.29 ± 3.64) points ($P = 0.03$). As, for the main physical characteristics there is a significant differences between both groups, where for explosive strength for hands the throw med ball test show significant differences between both groups Rubber Ropes group is (7 ± 0.24) meters and for Med Ball group is (11.56 ± 4.62) meters ($P = 0.01$), for explosive strength for legs the results of board jump test show significant differences between both groups Rubber Ropes group is (2.33 ± 0.06) meters and for Med Ball group is (2.40 ± 0.28) meters ($P = 0.01$), same for Torso flexibility the results of Sitting longitudinal torso flexion forward test show significant differences between both groups Rubber Ropes group is (41.42 ± 3.47) cm and for Med Ball group is (35.67 ± 1.72) cm ($P = 0.01$). however, for kinetic speed of the hand the results of dynamic Seep of upper limbs test show no significant differences between both groups Rubber Ropes group is (23.92 ± 1.21) repetition and for Med Ball group is (23.83 ± 1.41) repetition ($P = 5.64$).

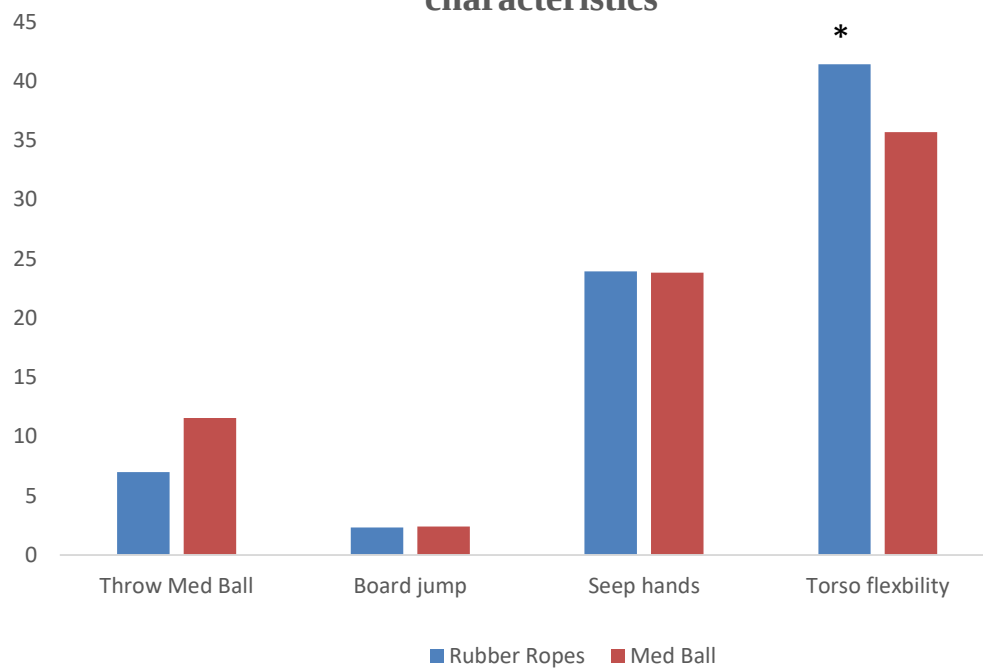
Comparing the results of post-test for basic skills



Significant level

Figure (5) shows there is significant differences between Rubber Ropes exercise group and Med Ball exercise group in Serve and the improvement for Med Ball exercise group, whereas, there is no significant differences between both groups in Forehand and Backhand.

Comparison the results of Post-test for physical characteristics



Significant level

Figure (5) shows there is significant differences between Rubber Ropes exercise group and Med Ball exercise group in explosive strength for hands and the improvement for Med Ball exercise group. Also there is significant differences between both groups in Torso flexibility but the improvement is for Rubber Ropes exercise group. However, there is no significant differences between both groups in explosive strength of lower legs and kinetic speed of hands.

4.2 Discussion

The results from table (2) show that there is no significant difference between group of using rubber ropes exercise and group of using med ball exercise in basic skills of tennis, also there is no significant difference between both groups in basic physical elements, and this prove that both groups are equal and achieve the equivalence of both groups, as Andrade, (2018) stated that both group study have to be similar before conducting the study.

As it can be seen from table (3) there is significant difference between pre-test and post-test for rubber ropes exercise group in backhand skills and serve, the researcher attributed that to the effectiveness of training program, and these results correspond with the results of Terraza-Rebollo, et al., (2017), James, et al., (2017), and Joshua, et al., (2020), where they found positive effect of elastic exercise on some basic skills in tennis and one of them was backhand. However, the results showed that there is no significant difference between pre-test and post of forehand skill, the researcher referred that the training program was not quite effective to improve the forehand skills, where the training should be effective to improve the skills (William, et al., 2012). Also

a study done by Ramajayam, (2017). the main purpose of the study was to identify the effect of 12 weeks 5 days a week elastic exercises on basic skills in tennis. 30 tennis players aged ranged from 21 to 23 years were participated in the study divided in to two groups control group (n = 15) and experimental group (n = 15), after twelve weeks specific drills with elastic band training exercises post test data were collected and analyzed. The study results showed that the experimental group had significantly altered selected variables explosive power and shoulder strength which was due to the influence of specific drills with elastic band training exercises training program. and also, there were an improvement in serve and forehand skills, but the control group did not improve on selected criterion variables.

The researcher attributed the improvement of both skills serve and backhand to the improvement of both explosive strength of shoulder and torso flexibility, as it can be noted that both physical elements are improved after 8 weeks of rubber ropes exercises. As Dewanti, et al., (2020) conducted a study aimed to developing a new method of resistance-based strength training using rubber ropes exercises for junior tennis players and examining the effectiveness on tennis skills performance compared to traditional model of training. 60 junior tennis players contributing to this study. the period of training program was for 8 weeks three times in a week. the results of t-test

proved that the training program was more effective in improving serve due to the improvement of strength of hands. Therefore, researchers concluded that the new model of resistance-based training can be implemented to elevates the serve performance level in tennis.

The researcher believes that the period of applying the training program for a period of (8) weeks was sufficient and good in terms of the development of the skill level of the players' backhand and serve skills on the one hand, and on the other hand, the use of rubber ropes, which is one of the modern aids that serve the skill level of performance, and because of the program's suitability For this category in terms of exercises and exercises and their diversity and gradation from easy to difficult and the introduction of the element of suspense and competition between the players on the one hand, and the application of the skills in question using rubber ropes where each training unit differed from the other, which introduced the element of challenge and competition among all players on the other hand, all of this contributed Significantly in the process of improvement and the development of the level of skill performance of tennis players, and what confirms this result is the size of the calculated effect, whose values ranged between (82-94 percent) and it is indicated according to Cohen's classification (Balnet, 2005).

From table (4) it is clear that there is significant different between pre-test and post-test for Med Ball exercise group in backhand skills and serve, the researcher attributed that to the effectiveness of training program, and these results correspond with the results of Riadh and Kadhum (2022), where they conducted a study on 15 male tennis player for 8 weeks 3 times in a week, they found that the med ball exercises was very effective in developing the performance of serve, forehand and backhand. the researchers believe that diversifying the training process with the help of the tools used raises the sample motivation as well as encouraging training and thus improving and developing the skill level, as Ignjatovic, et al., (2011) mentioned that the use of training tools is an important factor in increasing the aspects of physical activity and helping it develop a sense of timing and raise the efficiency of the players' performance, as well. These exercises used helped to create an adaptation in the technique of performing the front and back blows of the player as a result of repeating the performance with the help of the medical ball and other exercises that were applied with appropriate intensity and repetition in the chosen training method and rest periods that took into account the gradient and undulation in the training load in the duration of the application of the special exercises, and the two researchers agree with Wonjong, et al., (2017) "The reason for the development is the result of the methods used in training, the appropriate repetitions, and the continuation of performance until reaching the good level. The repetitions also contributed to the development of the accuracy of the skill performance of the research sample, as accuracy is one of the qualities that a tennis player must have as it indicates ability to guide the player to achieve a specific goal, as the game of tennis needs high accuracy in performance and that to direct the strikes to specific and specific places of the opponent's court, and the skill exercises used were all applied from

different areas of the playing field, starting from hitting the serve carried out from the base line until reaching the execution of the front and back strikes, which shortens the player's time from his arrival to the net and this rare. For physical characteristics of Med Ball exercise group, the results shows that there is significant different between pre-test and post-test in explosive strength of shoulder and torso flexibility, the research stated that to the training program was effective to improve those two physical elements. As Raeder et al., (2015) claim that Medicine ball training exercises seem to be a useful and inexpensive strength training strategy in enhancing functional performance.

Compering the results in post-test between both groups from table (5), there is significant different in serve skill, where the med ball group showed better improvement in serve and this is because of the nature of exercise, as Kara et al., (2015) examined the effects of 6-week specific med ball exercises program on serve performance in tennis players. Twenty healthy tennis players participated in the study and randomly divided into control (n = 10) and training groups (n = 10). While the training group performed combined routine tennis training and 3 sessions (each session 45-60 min) including medicine ball, resistance and balance exercises, the control group only performed routine tennis training on court. Serve velocity, body height and weight, body fat ratios were assessed initially and at the end of the six-week exercise program. As a result, tennis specific exercise training performed together with the 6-week tennis exercises program provided further improvement in the serve velocity of tennis players than those in the control group ($p < 0.05$). In conclusion, specific exercises are recommended to be performed in order to increase service speed. But the results show no significant different between both group in post test in forehand and backhand skills in post-test.

Also, from table (5) it obvious that there is significant different in post-test in some physical characteristics such as explosive strength of shoulder and legs and torso flexibility. When compare the results of table (5) we can see the group that following Med Ball exercises training is improved more that rubber ropes exercise training in explosive strength of shoulder and legs, the researcher attributed that to the nature of training by using Mad Ball exercises, where a med ball is one of the few pieces of equipment that can deliver results through either controlled or explosive repetition. It also brings a large percentage of your "total body" into play when performing the exercise. A study done by Ravi and Kalimuthu (2019) the aim of the research was find out the effect of med ball training on shoulder strength among Sudan school boy's football players in Qatar. Thirty (N=30) inter school football male player of Sudan nationalities selected randomly as subject of the study. The participants were randomly divided into two groups. first group consider as experimental group (N=15) and second group acted as control group (N=15). Experimental group underwent Medicine Ball Training three alternative days in a week and training section lasted 60 min for six week, and control group was not performing any specific training but they were participated in regular activities, the shoulder strength was assessed by Warner Test of

Soccer Skill, the pre and post-test data were collected on selected criterion variables prior to and immediately after the training program, they was concluded that the experimental group had shown significantly improved shoulder strength due to med ball exercises and control group had not showing any significant improvement. For explosive strength of legs, the results of table (5) showed med ball exercise group showed more improvement than rubber ropes exercise group. Following 8 weeks training workout of med ball are more effective to develop explosive strength of legs more than rubber ropes. A study done by Vassil and Bazanovk (2011), The purpose of this study was to identify the efficiency of composed plyometric training program on youth volleyball players force capabilities in their usual training period. The plyometric training program was applied during 16-week period, all subjects participated in following tests: standing long jump, depth leap long jump, medicine ball throws up in 10 seconds, medicine ball overhead throws forward against the wall in 10 seconds, maximal vertical jumps to the maximal height in 10 seconds, maximal vertical jump height. Testing results statistical analysis has shown athletes legs reliable improvement. Standing long jump, depth leap long jump and maximal vertical jump height test results, med ball throws and maximal vertical jumps to the maximal height in 10 seconds showed reliable difference.

However, compering the results of table (5), there is significant different between both groups in torso flexibility, where rubber ropes exercises group showed more improvement than med ball exercises group. Study design by Abed Maliha and Sadeqb (2015), which aims to designing and special training using rubber ropes. 16 female players of Fatat Baghdad Club for Fencing Epee were chosen. The control group was performing the usual physical and skill training in their curricula without using the experimental agent (rubber ropes). The experimental group, on the other hand performs the experimental variable (exercise by the use of rubber ropes). The training curricula was performed for eight weeks three times in a week. the researchers concluded that rubber ropes exercises were effective to improve the flexibility of torso for fencing players.

Chapter Five

5. Conclusions and Recommendations

5.1 Conclusions

Based on what the results of the study showed and in the light of the letretual revives and the related studies that were conducted within the limits of the study sample and its nature and statistical treatment, it is possible to the researcher should draw, through discussion and interpretation of the results, the following conclusions:

1. Exercising using a med ball has a positive effect on improving the level of physical fitness in the physical variables under study for the group that practiced exercises with medicine balls.
2. The exercises using the med ball under study have a positive effect on improving the skill performance of the serve and backhand skill of the group that followed the exercises with medicine balls.
3. Exercising using a rubber rope has a positive effect on improving the level of physical fitness in the physical variables under study for the group that practiced exercises with rubber rope.
4. The exercises using the rubber rope under study have a positive effect on improving the skill performance of the serve and backhand skill of the group that followed the exercises with rubber rope.
5. Using Med ball exercises is more effective to improve the serve in tennis than rubber ropes.

5.2 Recommendations

In light of the results and conclusions of the study, the researcher recommends the following:

1. Paying attention to educational and training programs using tools in general because of their impact and effectiveness in improving the physical and skill level in tennis.
2. Training application using medical ball exercises and rubber ropes in question on female players because of the positive results they have achieved.
3. Conducting more studies, scientific research and training programs for juniors in various other skills in tennis, using medical ball exercises and rubber ropes to raise the level Physical and skill

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Appendix.

Appendix (1)

Questionnaire for selecting physical characteristics for tennis player

Dear Expert

The researcher intends to conduct the study titled **(Comparison of the Effect of Using Rubber Ropes and Medicine Balls Exercises in Developing Some Motor and Physical Characteristics and Basic Skills in Tennis)**, on the sample of tennis players in Duhok. Based on your scientific background in sport training science, evaluation and measurements, and tennis, that encouraged the researcher to take your opinions in terms of suitability of the most effective physical characteristics for tennis player.

Name:

Scientific title and the date of obtaining it:

Researcher

Specialization:

Sagvan Ibrahim Tahir ALmahmada

Signature:

Date:

Physical Elements	Type	Selection		Note
		Yes	NO	
Strength	Explosive force of the lower limbs			
	Explosive power of the upper limbs			
	Maximum strength			
	Endurance strength			
	Speed-power of the upper limbs			
	Speed-power of the lower limbs			
Speed	Kinetic speed			
	Transition speed			
	reaction speed			
	Endurance speed			
Endurance	general Endurance			
	special Endurance			
Agility	general agility			
	special agility			
Flexibility	Active flexibility			
	Passive flexibility			
Balance	Kinetic balance			
	static balance			
Compatibility	general compatibility			
	special compatibility			
Accuracy				

Appendix (2)

Questionnaire for selecting fundamental skills in Tennis

Dear Expert

The researcher intends to conduct the study titled **(Comparison of the Effect of Using Rubber Ropes and Medicine Balls Exercises in Developing Some Motor and Physical Characteristics and Basic Skills in Tennis)**, on the sample of tennis players in Duhok. Based on your scientific background in sport training science, evaluation and measurements, and tennis, that encouraged the researcher to take your opinions in terms of suitability of the most skills in tennis player.

Name:

Scientific title and the date of obtaining it:

Researcher

Specialization:

Sagvan Ibrahim Tahir Almahmada

Signature:

Date:

	Type	Part	Selection		Note
			Yes	NO	
1	Forehand	Flat Forehand			
		Topspin Forehand			
		Slice Forehand			
2	Backhand	Flat Backhand			
		Topspin Backhand			
		Slice Backhand			
3	Serve	Flat			
		spin			
		Slice			
		Reverse			
		Under arm			
4	Revere serve				
5	Volley				
6	Half volley				
7	Smash				

Appendix (3)

Questionnaire for selecting physical characteristics for tennis player

Dear Expert

The researcher intends to conduct the study titled **(Comparison of the Effect of Using Rubber Ropes and Medicine Balls Exercises in Developing Some Motor and Physical Characteristics and Basic Skills in Tennis)**, on the sample of tennis players in Duhok. Based on your scientific background in sport training science, evaluation and measurements, and tennis, that encouraged the researcher to take your opinions in terms of suitability of the most suitable tests to measure physical characteristics for tennis player.

Name:

Scientific title and the date of obtaining it:

Researcher

Specialization:

Sagvan Ibrahim Tahir ALmahmada

Signature:

Date:

	Physical Elements	Type	Selection		Note
			Yes	NO	
1	Explosive force of the lower limbs	Sargent jump			
		Long jump			
		Dynamic platform			
2	Explosive power of the upper limbs	Throw med ball over the head			
		Throw med ball over the chest			
3	Kinetic speed	Arm rotation speed test around a basket			
		arm movement in the horizontal direction			
4	Active flexibility	Torso bend forward			
		Torso bend down			

Appendix (4)

Questionnaire for selecting test skills in Tennis

Dear Expert

The researcher intends to conduct the study titled **(Comparison of the Effect of Using Rubber Ropes and Medicine Balls Exercises in Developing Some Motor and Physical Characteristics and Basic Skills in Tennis)**, on the sample of tennis players in Duhok. Based on your scientific background in sport training science, evaluation and measurements, and tennis, that encouraged the researcher to take your opinions in terms of suitability of the most suitable test to measure the fundamental skills in tennis.

Name:

Scientific title and the date of obtaining it:

Researcher

Specialization:

Sagvan Ibrahim Tahir Almahmada

Signature:

Date:

	Type	Part	Selection		Note
			Yes	NO	
1	Flat Forehand	Middle long straight forehand accuracy test			
		Long side straight front kick accuracy test			
		Forehand test to divided area			
2	Flat Backhand	Middle long straight Backhand accuracy test			
		Long side straight back kick accuracy test			
		Backhand test to divided area			
3	Flat Serve	White for the accuracy of the serve in tennis			
		Jones test serve ground tennis			
		Serve test to different area			

Appendix (5)

Questionnaire for selecting fundamental skills in Tennis

Dear Expert

The researcher intends to conduct the study titled **(Comparison of the Effect of Using Rubber Ropes and Medicine Balls Exercises in Developing Some Motor and Physical Characteristics and Basic Skills in Tennis)**, on the sample of tennis players in Duhok. Based on your scientific background in sport training science, and tennis, that encouraged the researcher to take your opinions in terms of suitability of the training program for med ball exercise group.

Name:

Scientific title and the date of obtaining it:

Researcher

Specialization:

Sagvan Ibrahim Tahir ALmahmada

Signature:

Date:

Training part	Kind of exercises	Time	Reps	Sets	Intensity	Rest
Warm up 20 min	Running	15 min	-	-	45 – 50 %	-
	stretching	5 min	-	-	-	-
Main part 60 min	From standing, hitting a 2.8 kg medicine ball on the ground with both arms above the head	-	15	2	55 – 60 %	2 min
	From standing, he hits a 2.8kg medicine ball on the ground with one arm	-	5	2	55 – 60 %	2 min
	From standing, throw a medicine ball weighing 1.5 kg forward over the head with both arms	-	10	2	55 – 60 %	2 min
	From standing, he threw a medicine ball weighing 1.5 kg forward over the head with one arm	-	20	2	55 – 60 %	2 min
	From standing, throwing a medicine ball weighing 1.5 kg from the bottom to the front with both arms	-	10	2	55 – 60 %	2 min
Cooling down 10 min	Running	5 min	-	-	40 – 45 %	-
	stretching	5 min	-	-	-	-

Appendix (6)

Questionnaire for selecting fundamental skills in Tennis

Dear Expert

The researcher intends to conduct the study titled **(Comparison of the Effect of Using Rubber Ropes and Medicine Balls Exercises in Developing Some Motor and Physical Characteristics and Basic Skills in Tennis)**, on the sample of tennis players in Duhok. Based on your scientific background in sport training science, and tennis, that encouraged the researcher to take your opinions in terms of suitability of the training program for rubber ropes exercise group.

Name:

Scientific title and the date of obtaining it:

Researcher

Specialization:

Sagvan Ibrahim Tahir ALMAHMADA

Signature:

Date:

Training part	Kind of exercises	Time	Reps	Sets	Intensity	Rest
Warm up 20 min	Running	15 min	-	-	45 – 50 %	-
	stretching	5 min	-	-	-	-
Main part 60 min	Grab the elastic rope by the foot and pull it up one hand	-	15	2	55 – 60 %	3 min
	Grab the elastic rope by the foot and pull it up both hands	-	20	2	55 – 60 %	3 min
	Tie the rubber ropes to a pole and from standing and pull the rope forward one hand	-	15	2	55 – 60 %	3 min
	Tie the rubber ropes to a pole and from standing and pull the rope forward both hands	-	20	2	55 – 60 %	3 min
	Tie the rubber ropes to a pole and from sitting and pull the rope forward one hand	-	15	2	55 – 60 %	3 min
	Tie the rubber ropes to a pole and from sitting and pull the rope forward both hands	-	20	2	55 – 60 %	3 min
Cooling down 5 min	Running	5 min	-	-	40 – 45 %	-

Appendix (7)

	Name	Specialist	University
1	Prof.Dr. Oded Odisho Asi	Evaluation	Duhok
2	Asst. Prof. Dr. Jalal Kamal	Evaluation	Duhok
3	Asst. Prof. Dr. Azad Ahmad	Sport training	Duhok
4	Asst. Prof. Marcel Zaya	Sport training	Duhok
5	Asst. Prof. Ziyad Mahfooth	Sport training	Duhok
6	Asst. Prof. Samira Zaya	Sport training	Duhok
7	Asst. Prof. Bilal Khairi	Tennis	Duhok
8	Asst. Prof. Jameel Ahmad	Evaluation	Duhok
9	Dr. Zahra Jamil	Evaluation	Duhok
10	Dr. Nihad Ibrahim Taid	Evaluation	Duhok

ÖZGEÇMİŞ

Adı Soyadı	Sagvan Ibrahim taher almahmada
Kişisel Bilgiler	Uyruğu: T.C. Doğum Tarihi ve Yeri: XXXXX
İletişim Bilgileri	E-posta XXXXXXXXX
Öğrenim Bilgileri	Yüksek Lisans: 2021 – 2022
İş Deneyimi	XXX: XXX XXXX İl Milli Eğitim Müdürlüğü, XXXX Ortaokulu