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Mobility exercises to prevent epicondylitis in tennis players aged 20 to 23

Ejercicios de movilidad para prevenir epicondilitis en tenistas de 20 a 23 años

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Abstract

Introduction: Both lateral and medial epicondylitis are common injuries in tennis, where mobility is often reduced and can predispose players to their onset and poor prognosis. Objective: To describe the characteristics and patterns of flexibility exercise practice among young tennis players and their relationship with the frequency of elbow pain and satisfaction with the training program. Methodology: a mixed-methods, descriptive, cross-sectional, observational, non-experimental design was employed, using Likert-scale surveys to determine the prevalence of and factors associated with epicondylitis in 60 male tennis players aged 20–23 with at least two years of practice. Results: Tennis players spend many hours training and improve their game with mobility exercises, but the high frequency of elbow discomfort suggests that current routines should be modified to prevent injuries. Discussion: The results suggest that there is no association between performing mobility exercises and injury prevention, since elbow discomfort persists despite doing them. Conclusions: It is necessary to improve and individualize mobility exercise programs to make them more effective in treating risk factors for epicondylitis in tennis players.

Keywords: Epicondylitis, mobility exercises, young tennis players, injury prevention

Resumen

Introducción: La epicondilitis lateral como la medial son lesiones frecuentes en el tenis, donde la movilidad suele estar reducida y puede predisponer a su aparición y mal pronóstico. Objetivo: Describir las características y los patrones de la práctica de ejercicios de flexibilidad en tenistas jóvenes y su relación con la frecuencia de dolor en el codo y la satisfacción con el programa de entrenamiento. Metodología: se siguió un diseño mixto descriptivo-transversal observacional no experimental, encuestas tipo escala Likert para

determinar la prevalencia y factores asociados a epicondilitis en 60 tenistas varones de 20-23 años con mínimo dos años de práctica. Resultados: Los tenistas pasan muchas horas entrenando y mejoran su juego con los ejercicios de movilidad, pero la gran frecuencia de molestias en el codo sugiere que las rutinas actuales deben modificarse para prevenir lesiones. Discusión: Los resultados sugieren que no existe asociación entre la realización de movilidad y la prevención de lesiones, ya que, a pesar de realizarla, siguen existiendo molestias en el codo. Conclusiones: Es necesario mejorar e individualizar los programas de ejercicios de movilidad para que sean más efectivos en el tratamiento de los factores de riesgo de epicondilitis en tenistas.

Palabras clave: Epicondilitis, Ejercicios de movilidad, Tenistas jóvenes, Prevención de lesiones

One area of preparation and care that often doesn't receive adequate attention in training is joint mobility. A general mobility program, with particular focus on the elbow and shoulder, can help prevent both lateral and medial epicondylitis in young tennis players aged 20 to 23. Such mobilization should be targeted and focused, and should be performed primarily during the general preparation phase. However, the elbow and forearm region is frequently not mobilized. For this reason, a protocol of joint mobility exercises has been developed which, along with the general warm-up, prepares players for the exercise, training, or competition phase (Bespín 2024).

Introduction

Lateral and medial epicondylitis, more commonly known as tennis elbow and golfer's elbow, respectively, are injuries that affect the tendon insertions on the outer or inner side of the elbow. Both are caused by severe mechanical overload and have an incidence ranging from 1.6 to 7.2 per 1,000 tennis players. Despite their names, neither tennis nor golf, nor the presence of an abnormally fragile tendon, are direct causes of the condition. However, as in any sport, preparation and care are key factors in injury prevention.

Both lateral and medial epicondylitis are common tennis injuries, in which mobility is frequently reduced and can influence the onset and prognosis. Lateral epicondylitis of the elbow, or "tennis elbow," is the most common, although medial epicondylitis should also be considered. The main cause of the injury is strain on the tendon of the extensor carpi radialis brevis muscle, but involvement of areas near the elbow can contribute to the development of symptoms. In the context of tennis, the

development of elbow and forearm mobility, as well as shoulder mobility, are also related to lateral epicondylitis, although in the latter case, conclusive evidence has not been found (Christe et al. 2022).

Positioning the arms in a flexed position with forearm pronation causes the flexor and pronator muscles to shorten. Araya & Moyano, (2015) state that these muscles are responsible for controlling the traction force of the joint during the spike, so their function is directly or indirectly active during that moment.

Lateral and medial epicondylitis has been commonly associated with a lack of joint mobility in athletes with specific movement requirements involving the elbow and shoulder. Castro (2021) mentions that the development of a mobility program for the prevention of epicondylar tendon injuries in young tennis players considers joint mobilization as one of the elements that must be addressed in any sport. Good joint mobility can improve performance and prevent injuries.

Depending on the sport practiced, it will be necessary to focus on adequate and specific joint mobility. In tennis, joint mobility of the elbow and forearm, and of the shoulder, is essential for good performance. A restriction of mobility in any of these joints will not only decrease performance but can also be the origin of epicondylar tendon injuries related to competitive or training practice in this discipline. An alteration in joint mobility movement can alter movement patterns and generate or aggravate physical problems in athletes, such as epicondylar tendinopathies (Cruz, 2023).

The aim of this study is to describe the characteristics and patterns of flexibility exercise practice in young tennis players and its relationship to the frequency of elbow pain and satisfaction with their training programs. Determining the frequency of joint pain and analyzing the association between training time, the training surface, and the recommendations received will provide a detailed understanding of these factors and contribute to effective strategies for injury prevention and improved athletic performance.

Materials and methods

This research on epicondylitis in tennis players aged 20 to 23 years was designed using a mixed-methods approach, with a descriptive-cross-sectional design and a

non-experimental observational approach. This allowed for the characterization of the prevalence and associated factors of this condition in its natural context. A Likert-scale survey was used to analyze the relationship between training habits, the practice of mobility exercises, and the prevalence of elbow pain (epicondylitis) in young tennis players.

Participants

The study population consisted of 80 male tennis players aged 20 to 23 years, selected from local sports academies. Only those with a minimum of two years of tennis experience and who presented with mild pain in the elbow joint were included.

Sample

The sample consisted of 60 male tennis players aged 20 to 23, selected from local sports academies who attend the Oswaldo Fitness Center. All participants had at least two years of tennis experience and exhibited mild pain in the elbow joint.

Results

The results of the surveys administered to athletes are presented.

Table 1

How many hours a week does he train tennis?

Option	Frequency	Percentage
Less than 5 hours	5	8.3%
5 – 10 hours	15	25%
11 – 15 hours	20	33.3%
16 – 20 hours	10	16.7%
More than 20 hours	10	16.7%

Own elaboration

Analysis of Table 1 shows that the majority of young tennis players dedicate between 11 and 15 hours per week to training, representing 33.3% of the participants. This suggests a significant commitment to playing tennis, which could be crucial for skill development and injury prevention, such as tennis elbow. However, 25% train between 5 and 10 hours, which could indicate a developmental phase or personal limitations regarding available time. Furthermore, 16.7% train between 16 and 20 hours, and another 16.7% exceed 20 hours, reflecting variability in

dedication to the sport. This data is relevant for understanding the relationship between training time and injury incidence in this specific population.

Table 2

What type of surface do you mainly play on?

Option	Frequency	Percentage
Hard	25	41.7%
Clay	15	25%
Grass	5	8.3%
Synthetic	10	16.7%
Various	5	8.3%

Own elaboration

Table 2 shows the preferred playing surfaces for young tennis players; the majority play on hard courts (41.7%, 25 players). This indicates that hard courts are the most accessible or preferred by this group, which could be due to the availability of courts in their local area. Conversely, 25% (15 players) prefer clay courts, and only 16.7% (10 players) prefer synthetic surfaces. Grass and mixed surfaces are the least popular (8.3%, 5 players each). This variety of surfaces can influence training and injury prevention, as each surface has different impacts and risks of injuries such as tennis elbow. Therefore, these preferences should be considered when designing personalized mobility exercise programs for tennis players based on the surface they train and play on.

Tabl3 3

Who recommended that you practice mobility exercises?

Option	Frequency	Percentage
Coach	30	8.3%
Physiotherapist	10	25%
Teammate	5	33.3%
Self-learner	10	16.7%
Other	5	16.7%

Own elaboration

Table 3 shows the sources of recommendation for mobility exercises among young tennis players. It was observed that 33.3% (5 players) received the recommendation from a teammate, suggesting that peer influence can be a significant factor in the adoption of these practices. However, 8.3% (30 players) cited their coach as the primary source of recommendation, indicating that while coaches are an important source of guidance, their impact is not as high as that of teammates. On the other hand, 25% (10 players) were recommended by a physiotherapist, highlighting the importance of professional intervention in injury prevention. Self-learning and other sources each accounted for 16.7%. These results suggest that, while coaches

and physiotherapists are crucial, fostering communication and information sharing among teammates could be an effective strategy to promote the practice of mobility exercises and, therefore, injury prevention in this population.

Table 4

Mobility exercises performed more frequently

Option	Frequency	Percentage
Static stretching	15	25%
Dynamic stretching	20	33.3%
Exercises with resistance bands	10	16.7%
Yoga	10	16.7%
Pilates	5	8.3%

Own elaboration

Analysis of Table 4 reveals that dynamic stretching is the most frequently performed mobility exercise among young tennis players, with 33.3% (20 players) indicating it as their regular practice.

This suggests that tennis players are prioritizing exercises that can actively improve their flexibility and range of motion, which is essential for optimal performance and injury prevention. Static stretching is the second most common exercise, performed by 25% (15 players), indicating that it is also an important part of their mobility routine.

However, exercises with resistance bands and yoga are each mentioned by 16.7% (10 players), suggesting that, while valuable practices, they are not as popular among this population. Finally, Pilates is the least practiced exercise, with only 8.3% (5 players) indicating it. These results are relevant to understanding tennis players' preferences regarding mobility exercises, which can influence the design of specific training programs to prevent injuries such as epicondylitis.

Table 5

How satisfied are you with your current mobility exercise routine?

Option	Frequency	Percentage
Very satisfied	5	8.3%
Insatisfied	5	25%
Neutral	15	33.3%
Satisfied	20	16.7%
Very satisfied	15	16.7%

Own elaboration

As can be seen in Table 5, the satisfaction levels of young tennis players with their

mobility exercise routines are highly variable. 33.3% (15 players) are indifferent to their routines, which may indicate that they have not formed an opinion about their effectiveness or have not perceived any changes. On the other hand, 25% (5 players) are dissatisfied, which could indicate that they need to improve their routines to address any deficiencies. Conversely, 16.7% (20 players) are satisfied with their current routines, and 8.3% (5 players) are very satisfied. However, only 16.7% (15 players) are very satisfied, indicating that both satisfaction with and the effectiveness of the mobility exercises can be improved. These findings are relevant because satisfaction with the exercise routine can affect the motivation and commitment of tennis players, which in turn impacts performance and the prevention of injuries such as tennis elbow.

Table 6

How long have you been practicing mobility exercises?

Option	Frequency	Percentage
Less than 6 months	10	16.7%
6 months – 1 year	15	25%
1 a 2 years	15	16.7%
2 a 3 years	10	16.7%
More than 3 years	10	16.7%

Own elaboration

Table 6 shows the length of time young tennis players have been performing mobility exercises. 25% (15 players) have been training for between 6 months and 1 year, indicating that a large portion of the population is just beginning to adopt these routines.

Furthermore, 16.7% (10 players) have been practicing these exercises for less than 6 months, suggesting they are still familiarizing themselves with them. Another 16.7% (15 players) have been practicing for between 1 and 2 years, and another 16.7% for between 2 and 3 years. Finally, 16.7% (10 players) have been performing mobility exercises for more than 3 years.

These data reveal that the majority of tennis players (66.7%) have been practicing for less than 1 year or between 1 and 3 years, implying that there is room

to improve the effectiveness of these practices in preventing injuries such as tennis elbow. The number of years of practice can affect mobility and athletic performance, so it is necessary to promote constant practice in young tennis players.

Table 7

How often do you experience pain or discomfort in your elbow?

Option	Frequency	Percentage
Never	10	16.7%
Rarely	20	33.3%
Sometimes	15	25%
Frequently	10	16.7%
Always	5	8.3%

Own elaboration

Table 7 shows the frequency with which young tennis players experience elbow pain or discomfort. 33.3% (20 players) almost never experience pain; this indicates that, while not constant, it can be a concern. On the other hand, 25% (15 players) report occasional discomfort, which could suggest that the pain is not intense enough to limit performance. 16.7% (10 players) never experience pain, which is a good indicator of the health of this structure in a portion of the population.

However, 16.7% (10 players) report frequent pain, and 8.3% (5 players) report constant pain, demonstrating that a significant number may be at risk of developing more serious elbow problems. These results are relevant for understanding the frequency of elbow discomfort in young tennis players and how this may determine the need for preventative programs and mobility exercises to address these symptoms.

Table 8

How would you rate your overall performance in tennis since you started doing mobility exercises?

Option	Frequency	Percentage
Much worse	5	8.3%
Worse	5	8.3%
Same	15	25%
Better	20	33.3%
Much better	10	16.7%

Own elaboration

Table 8 presents the opinions of young tennis players regarding the overall evolution of their game since incorporating mobility exercises into their training. 33.3% (20 players) believe their game is "better," indicating that many have improved thanks to these exercises. Furthermore, 16.7% (10

players) feel "much better," demonstrating that mobility exercises are impacting their game. However, 25% (15 players) feel their game has remained "the same," which may mean that, despite performing mobility exercises, they haven't perceived any changes. Conversely, 8.3% (5 players) believe their game is "worse," and another 8.3% believe it is "much worse," data that warrant further investigation into the basis of these negative opinions. Overall, the results show that the majority of players improve their performance, suggesting the incorporation of mobility exercises into training to enhance performance and prevent injuries.

Discussion

The data in the tables provides an overview of the execution of flexibility exercises in young tennis players and their relationship to performance and the prevention of injuries such as epicondylitis. It can be observed that 33.3% of the tennis players train between 11 and 15 hours per week, demonstrating a high commitment to athletic development. Recent studies show that a high training volume is a factor in improving technique and endurance and reducing the risk of injury (Porras 2024). However, 25% train between 5 and 10 hours, which may indicate that they are just starting out or have limitations that prevent them from training more.

The preference for hard surfaces (Table 2), on which the majority (41.7%) of the tennis players play, may be a decisive factor. Hard surfaces increase the impact on the joints, making them prone to injuries such as epicondylitis (Villarrubia 2012). Therefore, mobility exercise programs will be adapted to the surfaces on which they train, with a focus on muscle strengthening and flexibility exercises to prevent injuries.

Regarding mobility exercise recommendations, Table 3 shows that 33.3% of the tennis players were recommended by teammates, demonstrating the importance of social support in acquiring healthy habits. Current literature indicates that teammate influence is a motivating factor for exercise (Barreras 2023).

However, the advice of coaches and physiotherapists is also vital; these professionals can offer evidence-based advice to prevent injuries.

The most common exercises, according to Table 4, are dynamic stretches, followed by static stretches. This aligns with research suggesting that dynamic stretches are superior for preparing

muscles before exercise and can improve performance (Arévalo et al. 2025). But it is concerning that only 8.3% do Pilates, an exercise that benefits core stability and strength and can prevent elbow injuries.

The level of satisfaction with mobility routines, as can be seen in Table 5, is very different among tennis players. 33.3% remain neutral; perhaps they have not perceived changes in their performance.

The literature indicates that the perceived effectiveness of an exercise program influences adherence to it (Rodríguez & Santander 2024). Therefore, these routines should be improved so that tennis players feel they are gaining something. Finally, Table 7 shows that 33.3% of tennis players almost never experience elbow pain, while 25% experience it sometimes.

These results are alarming because they indicate that many tennis players may be at risk of developing more serious problems. Recent studies have demonstrated that routinely performing mobility exercises reduces the likelihood of elbow injuries (Díaz, 2024). Therefore, preventive programs focused on arm muscle mobility and strengthening should be implemented.

In conclusion, the data show a commitment to training and the inclusion of mobility exercises, but there are still aspects to improve regarding player satisfaction and effectiveness. Incorporating exercises tailored to each tennis player's needs and providing ongoing education in injury prevention will be crucial for improving long-term performance and health.

Conclusion

Benefits of mobility exercises: These findings highlight the importance of including mobility exercises in the warm-up routines of young tennis players to prevent epicondylitis. Most participants who reported improved overall tennis performance incorporated these exercises into their routine, suggesting that proper mobility can enhance athletic performance.

Training frequency and surfaces: The study of training hours and surfaces played on by tennis players shows that most train regularly, primarily on hard surfaces. This is important, as hard surfaces are associated with a higher risk of injury. Therefore, mobility programs should be tailored to the properties of each surface to reduce these risks.

Recommendations and Sources of Inspiration: The impact of teammates on the incorporation of mobility exercises highlights the role of social support in sports. While coaches and physiotherapists are the main sources of advice, peer communication can be a way to improve adherence to mobility practices.

Satisfaction and Effectiveness of Routines: The varying levels of satisfaction with mobility exercise routines indicate room for improvement in the perceived effectiveness of these routines. It is important for coaches and physiotherapists to adapt these routines so that tennis players feel they are achieving real results, which can motivate and engage them.

Injury Prevention: The frequency with which tennis players experience elbow pain or discomfort suggests that many may be at risk of developing more serious problems. Performing specific mobility exercises and implementing preventative programs can decrease the likelihood of injuries such as epicondylitis and improve the future health of young tennis players.

In conclusion, this research highlights the need for greater integration of mobility exercises into the training of young tennis players and how this can help prevent injuries and improve athletic performance. Individualizing these routines and providing social and professional support can enhance well-being and athletic success.

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