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A COMPREHENSIVE ANALYSIS OF SPORTS INJURIES IN A PROFESSIONAL HANDBALL CLUB

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Abstract

Sports injuries pose a significant challenge to the performance, well-being and career longevity of athletes. This research delves into the field of sports injuries in the handball club RK Eurofarm Pelister, including 20 athletes in the period from July 25, 2022 to December 17, 2022. The research was conducted by an experienced physiotherapist and lasted five months with the primary goal of identifying the most common diagnoses among the athletes in the selected handball team.

Methods: A physiotherapeutic approach was used to assess and document the injuries sustained by the athletes during the specified period. Through detailed examination and analysis, the research aimed to define the frequency and nature of injuries within the professional handball club.

Results: Findings reveal a spectrum of injuries prevalent among handball athletes, with the most common diagnoses including ankle sprains, muscle spasms, patellar tendinitis, and anterior cruciate ligament (ACL) ruptures. Ankle sprains emerged as the leading injury, highlighting the vulnerability of the lower extremities in handball players. Muscle cramps and patellar tendinitis were also common, highlighting the impact of high-intensity and repetitive training. The occurrence of ACL tears highlights the inherent risks associated with the dynamic and physically demanding nature of handball.

Conclusion: This research provides valuable insights into sports injuries within the professional handball club Eurofarm Pelister. The prevalence of ankle sprains, muscle spasms, patellar tendinitis, and ACL ruptures underscores the need for focused preventative measures and rehabilitation strategies tailored to the specific demands of handball. Addressing these common injuries can improve athlete well-being, optimize performance, and extend career longevity, ultimately benefiting both the athletes and the overall success of the handball team.

Keywords: sports rehabilitation, handball club, physiotherapy, rehabilitation.

Introduction

Handball, a dynamic team sport, combines elements of speed, agility and intense physical contact. Handball requires quick movements, precise throws and strategic teamwork. However, athletes who engage in this high-paced sport are not immune to the challenges that come with it - injuries. (Wagner et al., 2014)

Sports injuries, as an inherent part of any activity with physical effort, are a particularly significant aspect for handball. With its explosive plays, sudden accelerations and complex footwork, handball exposes its participants to a set of injury risks. The nature of the game, characterized by rapid turns, jumps and collisions, places particular stress on the musculoskeletal system, making athletes susceptible to a range of injuries, both acute and chronic. (Vila et al., 2022)

The lower limbs bear the greatest load and physical effort. Ankle sprains, knee injuries and muscle strains are common problems faced by handball players. The sudden stops, starts and changes of direction inherent in the game contribute to the vulnerability of joints and muscles. In addition, frequent and forceful interactions with opponents add an element of unpredictability, increasing the potential for injury. (Martin-Guzon et al., 2021)

Apart from physical injuries, sports injuries in handball also initiate other problems in handball. The absence of key handball players as a result of injuries can significantly affect team dynamics and performance results. Coaches and physical therapists not only face the challenge of treating injuries, but also need to devise strategies to prevent their frequency. The complex interplay between competition and subsequent injury risks creates an additional problem in handball. (Nyhs et al., 2023)

This research on musculoskeletal injuries in handball tries to reveal the complexity of sports injuries in this sport. As a longitudinal study focusing on the complexity of specific injuries, their prevalence, and their implications on player performance, the foundation is focused not only on addressing the challenges, but also the potential for strategies focused on fostering a healthier and more consistent handball experience for athletes.

Methodology

The methodology applied for this research in sports injuries among 20 professional handball players of RK Eurofarm Pelister aimed to capture an understanding of the various challenges faced by athletes. The study spanned 145 days, aligning with the first half season of the 2022/2023 competition in the esteemed R.S. Super League. North Macedonia.

The research focused on the entire part of RK Eurofarm Pelister, consisting of 20 professional handball players. The selection included players from different positions, reflecting the diversity in the squad.

The research took place between July 25, 2022 and December 17, 2022, covering the critical period of the handball season. This time frame allowed for an overview of sports injuries during the transition from summer training to the start of domestic and Euroleague competitions.

The primary data collection was carried out by Hristijan Stojanovski, a member of the physiotherapeutic team of RK Eurofarm Pelister. Other members were the chief physiotherapist,

assistant physiotherapist and the head of the X-ray team, Dr. Aleksandar Dimovski at the Trifun Panovski Clinical Hospital, Bitola, who contributed valuable insights to this research.

Each of the 20 players had individual records detailing their name, position and a comprehensive overview of health conditions and sports injuries. The data includes specific injuries, dates of occurrence and circumstances surrounding the injuries.

Diagnostic tools used include diagnostic ultrasound, MRI scanning and X-ray. These tools help in making accurate diagnoses and understanding the severity of injuries.

Hristijan Stojanovski meticulously recorded and managed the data, ensuring accuracy and completeness. Records include information about health complaints, specific injuries, and injury management strategies used by the medical team.

The medical team had access to state-of-the-art physical therapy equipment, including electrostimulator (Compex), TECAR machine, SHOCKWAVE machine, laser therapy, electrotherapy, ultrasound machine and electroacupuncture equipment. These modalities facilitated the successful treatment and rehabilitation of players.

Data were subjected to statistical analysis to identify injury patterns and trends. The frequency of each type of injury was calculated to provide a comprehensive overview of the most common health problems faced by handball players.

The research acknowledged the limitations associated with the specific context of the handball season, including travel, changing training grounds and the transfer period, which could potentially affect injury rates.

The methodology adopted in this research aimed to capture a complete perspective on health and sports injuries among professional handball players, integrating both qualitative and quantitative data to provide a nuanced understanding of the challenges faced by athletes.

Results

As already stated, the study includes 20 respondents and more information about their name, surname, position, health conditions and sports injuries that they acquired during the research period, i.e. between 25.07.2022 to 17.12.2022, follows. as well as dates when they happened:

Athlete – Right Wing	
03.08.2022	Sprain of the left ankle
07.11.2022	Sprain of the left ankle – during training
20.11.2022	Muscle spasm of the m. infraspinatus in the dominant (shooting) shoulder

Table number 1. Analysis of injuries in athletes – right wing.

Athlete – left wing	
03.08.2022	Stretching of m. pectineus
18.08.2022	Diagnosed "jumping knee" syndrome on the left leg

Table number 2. Analysis of injuries in an athlete - right wing.

Athlete – left wing	
04.08.2022	Inflammation of the patellar tendon on the right knee due to strain
09.11.2022	Inflammation and thickening of the Achilles tendon on the right leg

Table number 3. Analysis of injuries in athlete – left wing

Athlete – left back	
19.10.2022	Distortion of the right ankle during training
17.12.2022	Partial rupture of the anterior cruciate ligament of the left knee

Table number 4. Analysis of injuries in athlete – left back.

Athlete – right wing	
05.08.2022	Inflammation of the Achilles tendon on the right leg
13.08.2022	Left knee contusion
18.08.2022	Edema of the fifth metatarsal bone caused by a direct impact
17.11.2023	Stretching of the m. adductor magnus

Table number 5. Analysis of injuries in athlete – right wing.

Athlete – center back	
25.11.2022	Edema on the left knee due to contusion

Table number 6. Analysis of injuries in athlete – center back

Athlete – right back	
31.07.2022	Inflammation of the Achilles tendon
19.09.2022	Distortion of the right ankle joint
09.11.2022	Distortion of the right ankle joint

Table number 7. Analysis of injuries in athlete - right back

Athlete – left wing	
03.08.2022	Inflammation of the patellar tendon (left knee)
24.08.2022	Diagnosed purulent angina
04.11.2022	Inflammation of the tendon of the long head of m. biceps femoris

Table number 8. Analysis of injuries to athlete – left wing

Athlete - goalkeeper	
20.08.2022	Positive for corona virus
23.09.2022	Inflammation of the patellar tendon (right knee)

Table number 9. Analysis of injuries in athlete – goalkeeper

Athlete - goalkeeper	
15.08.2022	Pain in the adductors during lateral movements, significant swelling and inflammation of the insertion itself with the os pubis was diagnosed
25.10.2022	Rupture of m. soleus on the left leg

Table number 10. Analysis of injuries in athlete – goalkeeper

Athlete – left back	
27.07.2022	Spasm of m. deltoideus and m. supraspinatus on the right shoulder (shooter)
08.08.2022	Distortion of the left ankle
15.09.2022	Presence of fluid in the capsular cavity of the left knee, post-traumatic changes due to partial rupture of the anterior cruciate ligament
01.12.2022	Surgery to restore the damaged anterior cruciate ligament (surgery performed in France)

Table number 11. Analysis of injuries in athlete – left back

Athlete – right back	
10.08.2022	Inflammation of m. biceps femoris on both legs
31.08.2022	Compression of one of the nerves of the brachial plexus near the left shoulder (nerve impingement)
17.09.2022	Sprain of medial ligament on right knee established
01.04.2023	Dislocation of the hallux on the left foot during a match without physical contact

Table number 12. Analysis of injuries to athlete – right back

Athlete – center back	
04.08.2022	Established chronic inflammation of the patellar tendon on the right knee
03.09.2022	Performed dental intervention due to suppuration in the oral cavity
22.09.2022	Increased spasm in the lumbar region, established disc swelling between L4-L5 (discopathy)
14.10.2022	Tendinitis of the left knee

Table number 13. Analysis of injuries in athlete – middle back

Athlete - the pivot	
04.11.2022	Tension between the two scapulae, spasm of the mm. rhomboidei
15.11.2022	Hip hematoma (os coxae) caused by a direct fall on a hard surface

Table number 14. Analysis of injuries in athlete - right back

Athlete – right back	
05.08.2022	Mild inflammation of the patellar tendon on the right knee
10.08.2022	Tension and discomfort in the back muscle region of the right leg
18.09.2022	Established viral cold

Table number 15. Analysis of injuries in athlete – right back.

Athlete - the pivot	
04.08.2022	Contusion of m. obliquus abdominis externus
29.08.2022	Established viral cold
18.09.2022	Established viral cold
15.09.2022	Stretching of m. adductor magnus during uncontrolled lateral movement
10.01.2023	Appearance of initial flu symptoms

Table number 16. Analysis of injuries in athlete – pivot

Athlete – right back	
25.10.2022	Surgery for the reconstruction of the medial patellofemoral ligament

Table number 17. Analysis of injuries in athlete – right back

Athlete – left back	
23.08.2022	Edema on the left knee due to previous internal damage, a puncture was performed
16.11.2022	Surgery of the lateral and medial meniscus of the left knee

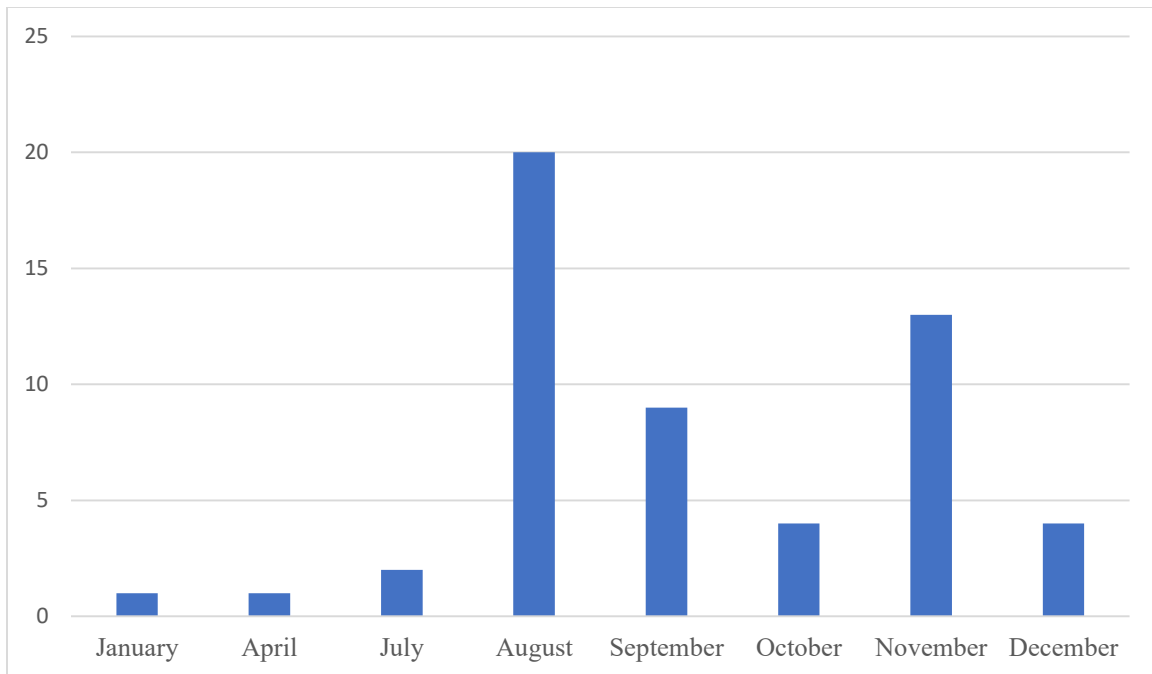
Table number 18. Analysis of injuries to athlete – left back

Athlete - goalkeeper	
27.11.2022	Appearance of edema under increased load on the right knee

Table number 19. Analysis of injuries in athlete – goalkeeper

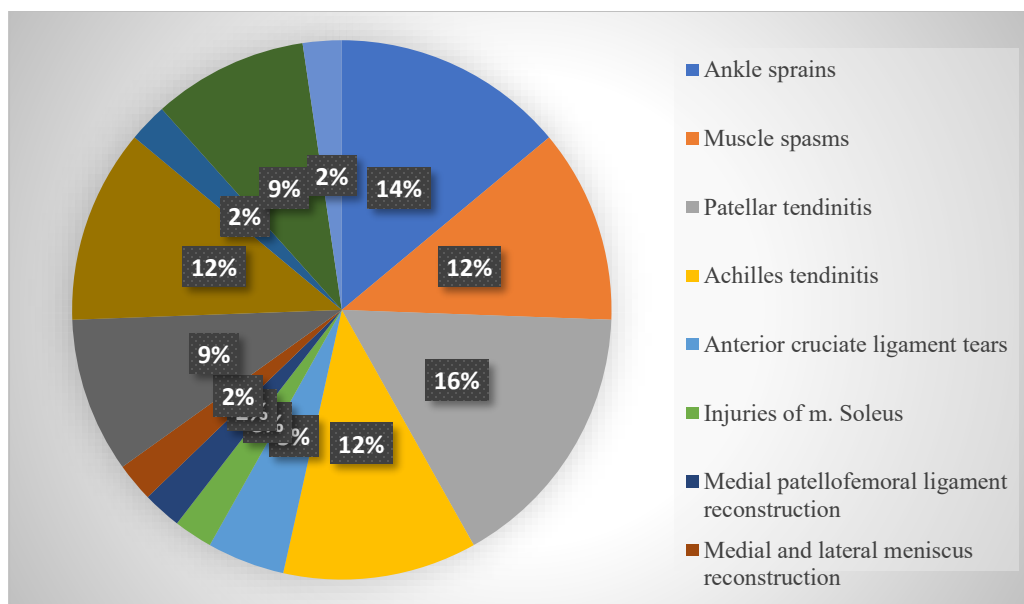
Athlete – left back	
07.11.2022	Inflammation of the left Achilles tendon
11.11.2022	Viral infection
12.12.2022	Inflammation of the right Achilles tendon
16.12.2022	Tension in the thoraco-lumbar region

Table number 20. Analysis of injuries in athlete – left back



Picture number 1. Frequency of injuries by month.

According to the received data on the frequency of occurrence of injuries by month, in the months of January and April there was 1 injury, in the month of July 2 injuries, in the month of August 20 injuries, the month where the majority of injuries occurred, in the month of September 9 injuries, in the month of October 4 injuries, in the month of November 13 injuries and in the month of December 4 injuries in the period of 2022-2023.



Picture number 2. Analysis of injuries among athletes.

According to chart number 2, the most common injuries among athletes are ankle sprains, muscle spasms, patellar tendinitis and Achilles tendinitis. Of the non-specific sports conditions, most of the athletes had respiratory problems (virus, cold, coronavirus).

Conclusion and discussion

The review of health and sports injuries among the 20 professional handball players of RK Eurofarm Pelister provides insights into the challenges faced by athletes in this high-intensity sport. Individualized results highlight the diverse nature of injuries, underscoring the need for a holistic approach to player health

The high frequency of ankle joint injuries, especially sprains, among handball players is notable. The nature of the sport, with its quick turns, jumps and sudden stops, places considerable stress on the ankle. The identification of this commonality emphasizes the importance of targeted preventive measures and ankle rehabilitation strategies. Many studies confirm the same. (Bedo et al., 2019)

Muscle spasms and thoracolumbar rotator cuff problems indicate upper body strain in athletes, potentially attributable to the forceful throwing inherent in handball. Addressing upper body strength and conditioning can play a key role in injury prevention and performance optimization. (Schilling et al., 2021)

The prevalence of tendon-related injuries such as patellar and Achilles tendinitis highlights the repetitive stress that lower extremity tendons endure. A focused approach to tendon health, including focused sport-specific exercises can mitigate the risk of these common injuries. (Wang et al., 2022)

Ligament injuries, especially anterior cruciate ligament (ACL) tears, have significant impacts on players' careers. The need for operative interventions in certain cases emphasizes the seriousness of these injuries. Strengthening programs and careful monitoring can be very important in the prevention and management of ligamentous problems. (Renstrom et al., 2008)

The emergence of respiratory problems, including viral infections, colds and the coronavirus, highlights the impact of external factors on players' health. The need for preventive measures, especially in critical months with increased travel and a changing environment becomes obvious. (Hui, 2006)

The analysis reveals a concentration of injuries in certain months, especially August, October and November. This aligns with the transfer period and changing training surfaces, suggesting the need for increased vigilance during these transition phases to minimize injury risks. There are numerous researches focused on this topic. (Fuller et al., 2020)

The availability of advanced medical equipment for physical therapy, including electrostimulators, TECAR devices, SHOCKWAVE devices played a key role in the successful treatment and rehabilitation of players. The expertise of the medical team in utilizing these resources contributed to the overall well-being of the athletes. Many research papers have emphasized the need for the use of modern physical modalities for the successful rehabilitation of handball players. (Simplicio et al., 2020)

In conclusion, the detailed examination of health and sports injuries among RK Eurofarm Pelister handball players allows an adequate understanding of the complex challenges found in sports. The individualized results underscore the need for a tailored and holistic approach to player health that includes injury prevention, targeted rehabilitation and ongoing monitoring. The research not only identifies commonalities of injuries, but also highlights the unique and varied health profiles of each athlete.

Moving forward, proactive measures in conditioning, strength training, and injury prevention protocols can be instrumental in reducing the incidence of common injuries. The critical months identified in the analysis require increased attention during transition phases to minimize external impacts on players' health. The collaborative efforts of physical therapists, medical professionals and the athletes themselves are key to fostering a culture of preventive care and continuous improvement.

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