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RESEARCH ARTICLE

Overview of Sports-Related Knee Injuries Managed Operatively at RSU Haji Medan in 2023

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Abstract: Introduction: Knee injuries are one of the sports-related injuries that frequently require operative management. The prevalence of knee injuries is 9%, with 48 cases per 1000 patients involving ACL injuries. **Methods:** This study used a quantitative descriptive method with a cross-sectional design. Data were collected from medical records and interviews using the Indonesian-International Knee Documentation Committee (I-IKDC) questionnaire. **Results:** From 33 patients, the majority were aged 19–44 years (90.9%), male (87.9%), and most injuries occurred during soccer (30.3%). The most common type of injury was ACL injury (75.8%). The mean I-IKDC score was 62.6 with a standard deviation of 9.1, with a minimum score of 49.4 and a maximum score of 82.7. **Conclusion:** Sports-related knee injuries predominantly occurred in males of productive age, especially while playing soccer, with ACL injuries as the most frequent type. Postoperative knee function was in the moderate category.

Keywords: Knee Injury, I-IKDC Score, Sports, Functional Evaluation

INTRODUCTION

Injuries arising from sports activities have become a commonly encountered health problem in society(1), especially with the increasing public enthusiasm for physical activity(2). Injuries to the musculoskeletal system—particularly the knee—show high incidence rates both nationally and globally(3).

The knee joint is prone to trauma due to its vital function in supporting body weight and enabling various sports-related movements(4). Trauma risk increases in high-intensity sports involving physical

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contact, such as soccer and futsal(5). Several contributing factors include age, gender, type of sport, and training intensity(6).

Knee injuries can disrupt daily activities and occupational tasks(7). Various traumatic conditions such as ligament injuries—including Anterior Cruciate Ligament (ACL), Posterior Cruciate Ligament (PCL), Medial Collateral Ligament (MCL), Lateral Collateral Ligament (LCL), and meniscal injuries(8)—may require surgical intervention when severe, with the aim of restoring normal knee function(9).

RSU Haji Medan is one of the healthcare centers handling sports injuries in orthopedics. This study aims to describe patient demographics including age, gender, type of sport, previous injury history, types of knee injuries, and postoperative outcomes using the Indonesian-International Knee Documentation Committee (I-IKDC) score treated during the year 2023(10).

METHODS

This research used a descriptive quantitative approach with a cross-sectional design. Subjects included all patients with sports-related knee injuries who underwent surgery at RSU Haji Medan in 2023.

Human subjects were included, and sample collection was performed using total sampling, meaning all patients who met the criteria were included RSU Haji Medan 2023.

Data were collected from medical records and interviews using the Indonesian-International Knee Documentation Committee (I-IKDC) questionnaire. The data were processed univariately and presented as frequencies and percentages.

RESULTS

Prior to administering the questionnaire to participants, ethical approval was obtained from the Ethics Committee with Approval Number: 1432/KEPK/FKUMSU/2024.

Based on the collected data, a total of 33 patients with sports-related knee injuries who underwent operative management at RSU Haji Medan in 2023 met the inclusion criteria.

The data used in this study were primary data obtained from the medical records of the Orthopedic Department, Sports Injury Subspecialty. The variables assessed included age distribution, gender distribution, history of prior injury, type of sport, type of knee injury, and clinical outcomes.

Tabel 1. Distribution by Age

Age (Years)	Frequency	Percentage (%)
4-5	0	0
6-10	0	0
11-18	3	9,1
19-44	30	90,9
45-59	0	0
≥60	0	0
Total	**33**	**100%**

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Based on table 1, the age distribution of patients with knee injuries treated at RSU Haji Medan shows that the majority were between 19 and 44 years old, accounting for 30 patients (90.9%), followed by those aged 11 to 18 years, totaling 3 patients (9.1%) 4 until 5 years (0%), 6 until 10 years (0%), 45 until 59 years (0%), and more of 60 years (0%).

Tabel 2. Distribution by Gender

Gender	Frequency	Percentage (%)
Male	29	87,9
Female	4	12,1
Total	**33**	**100%**

Based on table 2 above, the frequency distribution by gender among patients with knee injuries at RSU Haji Medan shows that the majority were male, totaling 29 individuals (87.9%), while females accounted for 4 individuals (12.1%).

Tabel 3. Distribution by Type of Sport

Type of Sport	Frequency	Percentage (%)
High-Risk Sports		
Parkour	1	3,0
Kempo	1	3,0
Silat	1	3,0
Soccer	10	30,3
Futsal	6	18,2
Moderate-Risk Sports		
Basketball	3	9,1
Volleyball	5	15,2
Sepak Takraw	1	3,0
Low-Risk Sports		
Running	4	12,1
Hiking	1	3,0
Total	**33**	**100%**

Based on table 3 above, the frequency distribution by type of sport among patients with knee injuries at RSU Haji Medan shows that the highest number of cases occurred in soccer with 10 patients (30.3%), followed by futsal with 6 patients (18.2%), volleyball with 5 patients (15.2%), running with 4 patients (12.1%), basketball with 3 patients (9.1%), parkour with 1 patient (3.0%), kempo with 1 patient (3.0%), silat with 1 patient (3.0%), sepak takraw with 1 patient (3.0%), and hiking with 1 patient (3.0%).

Tabel 4. Distribution of Previous Injury History

Previous Injury History	Frequency	Percentage (%)
Dislocation	0	0
Fracture	0	0
Sprain	0	0
Strain	0	0
Total	**0**	**0**

Berdasarkan tabel 4 di atas distribusi frekuensi berdasarkan riwayat cedera sebelumnya pada pasien cedera lutut di Rumah Sakit Umum Haji Medan dengan dislokasi (0%), fraktur (0%), *sprain* (0%), dan *strain* (0%).

Tabel 5. Distribution by Type of Knee Injury

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Type of Knee Injury	Frequency	Percentage (%)
ACL Injury	25	75,8
PCL Injury	3	9,1
LCL Injury	0	0
MCL Injury	0	0
Meniscal Injury	5	15,2
Total	**33**	**100%**

Based on table 5 above, the frequency distribution of knee injuries among patients with knee injuries at RSU Haji Medan shows that the most common injury was ACL injury with 25 patients (75.8%), followed by meniscal injury with 5 patients (15.2%), PCL injury with 3 patients (9.1%), while MCL injury (0%) and LCL injury (0%) were not found.

Tabel 6. Distribution of I-IKDC Outcome Scores

Statistic	Frequency
N	33
Mean	62,6
Standard Deviation	9,1
Minimum	49,4
Maximum	82,7

Based on Table 6 above, the frequency distribution of the I-IKDC outcomes among patients with knee injuries at RSU Haji Medan shows a mean score of 62.6, which generally indicates moderate knee function. The standard deviation of 9.1 reflects a moderate spread of values, with a minimum score of 49.4 and a maximum score of 82.7.

DISCUSSION

In the age distribution of 4–5 years (0%), 6–10 years (0%), 11–18 years (9.1%), 19–44 years (90.9%), 45–59 years (0%), and ≥60 years (0%), this finding is consistent with the study by Griffin et al. (2006), as individuals within the productive age range and those engaging in physical activities—particularly those aged 20–40 years—are more prone to sustaining injuries.(11).

The age distribution for sports-related knee injuries is consistent with Lohmander et al. (2007), who reported that injuries generally occur in younger individuals who are still physically active. Sports injuries at a young age also pose long-term risks, potentially leading to functional impairment in affected individuals(12).

In the gender distribution, males accounted for 87.9% and females 12.1%. This is in study by Sanders et al. (2016), which found that males aged 19–24 years showed a higher incidence of ACL injuries(13), this is because males tend to participate more frequently in sports that involve sudden changes in direction and physical collisions, which are the main mechanisms of knee injury(14).

The gender distribution for sports-related knee injuries is consistent with Stubbe et al. (2015), who reported that lower-extremity injuries are more common among professional male soccer players, indicating a higher incidence in males compared to females(15).

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In the distribution of sports types—parkour (3.0%), kempo (3.0%), silat (3.0%), soccer (30.3%), futsal (18.2%), basketball (9.1%), volleyball (15.2%), sepak takraw (3.0%), running (12.1%), and hiking (3.0%)—the findings align with Majewski et al. (2006), who stated that soccer involves exploratory movements, high intensity, and physical contact, in addition to the long duration and high frequency of training and matches(14).

The distribution of sports types for sports-related knee injuries is also consistent with Astur et al. (2023), who found that soccer presents the highest risk for ACL injury in both youth and adult groups(16).

In the distribution of previous injury history, no prior injuries were found among the patients, including dislocation (0%), fracture (0%), sprain (0%), and strain (0%). This is consistent with the study by Griffin et al. (2000), which stated that an ACL injury does not require the presence of a previous injury, as ACL injuries may even occur without direct contact or during everyday activities(17).

In the distribution of knee injury types—ACL injury (75.8%), PCL injury (9.1%), MCL injury (0%), LCL injury (0%), and meniscal injury (15.2%)—the findings align with Prodromos et al. (2007), who reported that ACL injuries occur significantly more frequently than other types. This is because the ACL is vulnerable to non-contact mechanisms such as landing, sudden twisting, and sudden stopping(18).

The distribution of knee injury types in sports-related knee injuries is also consistent with Dewig et al. (2024), who found that ACL injuries are more common among athletes in the National Collegiate Athletic Association (NCAA) in the United States, particularly in sports such as soccer and baseball(19).

In the distribution of knee injury outcomes, the mean score was 62.6, which generally indicates moderate knee function. The standard deviation of 9.1 reflects a moderate spread of values, with a minimum score of 49.4 and a maximum score of 82.7. According to Irrgang et al. (2006), the I-IKDC is a highly responsive assessment tool, with knee functional outcomes varying depending on individual factors, rehabilitation adherence, and the severity of the injury(20). The minimum and maximum scores indicate that the lowest values fall within the moderate category, while the highest values approach near-normal knee function.

CONCLUSION

This study shows that sports-related knee injuries managed operatively at RSU Haji Medan in 2023 occurred most frequently in males of productive age (19–44 years), with soccer being the most common causative sport. The most dominant type of injury was ACL injury. Postoperative

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functional evaluation using the I-IKDC score showed results within the moderate category, indicating that functional limitations of the knee were still present despite operative intervention. This highlights the importance of injury-prevention education, the role of postoperative rehabilitation, and the need for long-term monitoring of patients' functional outcomes.

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