

**Mapping the Injury History of Indonesian Kabaddi Athletes****Irana Mery Alviana<sup>1\*</sup>, S Sugiharto<sup>2</sup>, Nia Sri Ramania<sup>1</sup>, Muhamad Fahmi Hasan<sup>1</sup>**<sup>1</sup>Department of Sports Science, Institut Teknologi Bandung, Bandung, Indonesia<sup>2</sup>Department of Sport Science, Faculty of Sport Science, Universitas Negeri Semarang, Indonesia**Article Info***Article History :**Received December 2022**Revised February 2023**Accepted March 2023**Available online April 2023**Keywords :**injury history, kabaddi Athletes***Abstract**

Sports injuries in athletes will affect their performance. The purpose of this study was to determine and find out the common injuries experienced by Kabaddi athletes in Indonesia. This study used a quantitative descriptive research design. The instrument used in this study was an injury report questionnaire. The questions focused on anthropometry, types of injury, and causes of injury. The population of this study was Kabaddi athletes spread across provinces in Indonesia. The samples of this study were taken using a purposive sampling technique. The inclusive criterion included Kabaddi athletes who had or were currently experiencing injuries. The samples of the study were 41 athletes (n = 41). In female Kabaddi athletes, the most common injuries were found in the upper body and experienced by athletes in the defender position (61.5%). Injuries to the lower body were mostly experienced by a raider (38.5%). The body parts that were commonly injured in male Kabaddi athletes, especially to the upper body, involved mostly wrist injuries (14.29%) followed by shoulder/clavicle and upper arm injuries (7.14%). In the lower body, the most common injuries were on the knees (21.43%) and ankles (17.86%). Meanwhile, in other parts of the body, the injury mostly occurred on the head, such as the face, nose, and mouth, (10.71%). In female Kabaddi athletes, the most common injuries occurred to the upper body, including to the shoulder/clavicle (30.77%). Meanwhile, in the lower body, the injury mostly occurred to the ankle (15.38%). This study shows that the most common injuries to male Kabaddi athletes in Indonesia are injuries to the lower body, namely the knee, and ankle, while the most common injury to female Kabaddi athletes is an injury to the upper body, namely the shoulder/clavicle.

## INTRODUCTION

Kabaddi is a traditional sport originated in India. Kabaddi is a body contact sport because it uses a lot of pushing, pulling, jumping and twisting techniques (Subba, 2022). Body contact sports have a high risk of injury (Johnson et al., 2023). Kabaddi is a sport that has a high risk of injury during training and matches (Harry & George, 2021). Kabaddi is a high-contact sport with a significant injury rate that can affect athlete performance (Gupta, et al, 2020).

Kabaddi is a type of high-intensity intermittent sport (Pawar & Borkar, 2018). The principle of the Kabaddi game is to attack and defend. Each team of 7 players in the physically demanding sport of Kabaddi has a certain role to play, with the raider's job being to get points and the defenders' role being to defend the team and stop a raider from scoring.

Important body movements in Kabaddi sport are catching, holding, locking, and jumping (Shobha & Jyoti, 2022). Kabaddi is an aggressive team sport, where players play without using tools. This Kabaddi sport requires agility, muscle coordination, capacity to hold your breath, quick response, and strategy (R. Mohanakrishnan & K. Murukesan, 2021). In addition, playing Kabaddi calls for quick actions and reactions, including defending, blocking, pushing, kicking, and toe touches (Yallappa, 2020b). Kabaddi is a strong physical contact sport. As Yallappa (2020a) notes, Kabaddi is a very fast, rough, and tough sport, and as a result, many injuries happen. The individual defense and group attack characteristics of this sport also make Kabaddi players vulnerable to many types of injuries, and many parts of the body are susceptible to these types of injuries. Kabaddi involves fast and powerful body movements during the conduct; this requires offensive and defensive skills that make players vulnerable to various types of sports injuries that may occur during competition and training (Pal, Kalra, Kumar, Pawaria, & Rishi, 2020).

According to previous research, the most common injuries in Kabaddi sports are to the legs (50.46%), followed by the arms (33.03%), the torso (11.93%), and the head and neck (4.59%). Sports injuries in men and women are quite comparable in terms of gender, with most occurring in the knee, ankle, finger, waist, and shoulder/clavicle (Park & Kim, 2020). Injuries to the lower body, such as ankle injuries, can impair athletes'

ability to maintain static and dynamic balance (Alghadir, et al, 2020). Injuries to the hamstring can also impair athletes' performance, and if not treated seriously, the rate of re-injury is very high (Hickey, et al, 2022).

Various interesting studies have been conducted on Kabaddi, especially the ones on the typical injuries suffered by Kabaddi athletes. However, there has been no research on injuries that occur in Indonesian Kabaddi athletes, particularly in terms of gender. Injuries experienced by an athlete will affect the athlete's performance. The purpose of this study is to discover the most prevalent injuries suffered by Kabaddi athletes in Indonesia. Therefore, it is anticipated that the findings of this study will help develop and implement techniques for mitigating the consequences of injuries, particularly in Kabaddi sports.

## METHODS

This study used a quantitative descriptive research design, in which the findings and conclusions were derived from quantitative data pertaining to the circumstances of the research participants.

### Participants

The population of this study consisted of Kabaddi players from every province in Indonesia. Purposive sampling was used, with the inclusion criteria being (a) Kabaddi athletes who had experienced injuries, (b) Kabaddi athletes who were currently injured, and the exclusion criteria being (a) Kabaddi athletes who were no longer active.

### Materials

The instrument used in this study was an injury report questionnaire containing anthropometric questions including height, weight, and BMI, type of injury, and cause of injury, which referred to a research publication written by Fuller et al., (2006).

### Procedure

The selection based on the study criteria yielded a sample of 41 athletes ( $n = 41$ ). The questionnaire was distributed through Google Forms. The research results from the questionnaire survey were processed using Microsoft Excel Spreadsheets to create a matrix, which was described as data from which conclusions were formed.

**RESULT**

Table 1 shows the anthropometry of male and female Kabaddi athletes. The distribution of anthropometric data for male Kabaddi athletes shows that the youngest athlete was 13 years old and the oldest was 34 years old ( $21.69 \pm 4.02$ ). The results suggested that male Kabaddi athletes had a normal BMI value ( $24.58 \pm 2.45$ ). The distribution of anthropometric data for female Kabaddi athletes revealed that the youngest female Kabaddi athlete was 18 years old and the oldest was 32 years old ( $22.89 \pm 4.08$ ), with BMI values in the normal category ( $22.67 \pm 2.13$ ).

**Table 1.** Questions on injury report of the Rugby players

	N	Min	Max	Mean	St.Dev
Age	41	13	34	21.69	$\pm 4.02$
Height	41	1.2	1.82	1.70	$\pm 11.48$
Weight	41	46	85	70.11	$\pm 8.74$
BMI	41	20.08	31.94	24.58	$\pm 2.45$

**Table 2.** Anthropometric and age-based group distribution

	N	Min	Max	Mean	St.Dev
Age	41	18	32	22.89	$\pm 4.08$
Height	41	1.56	1.7	1.62	$\pm 5.52$
Weight	41	48	72	59.85	$\pm 6.85$
BMI	41	19.83	25.71	22.67	$\pm 2.13$

**Table 3.** Classification of types of injuries

	Raider	Defender	Injuries		
			Upper Limb	Lower Limb	Other Body
Male	17	11	10	15	3
Female	5	8	8	5	0

As shown in Table 3, different injuries could happen to Kabaddi players depending on their position and gender. According to the classification of injury categories, male Kabaddi players sustained the majority of lower body injuries (53.6%), which were frequently experienced by raiders or attackers. Meanwhile, defenders suffered the most upper-body injuries (35.7%) and the injuries to other parts of the body experienced by a raider (10.7%). In female Kabaddi athletes, the most injuries were happened to the upper body and were sustained by athletes in the defender position (61.5%),

while female raiders (38.5%) sustained injuries to the lower body.

**Table 4.** Classification of injured body parts

Parts of Injury	Male (%)	Female (%)
Upper Limb		
Neck/Spine	1 (3.57%)	0 (0%)
Sternum/Ribs/Back	0 (0%)	1 (7.69%)
Stomach	0 (0%)	1 (7.69%)
Pelvis	1 (3.57%)	0 (0%)
Shoulder/Clavicle	2 (7.14%)	4 (30.77%)
Upper arm	2 (7.14%)	1 (7.69%)
Wrist	4 (14.29%)	1 (7.69%)
Hand/Fingers/Thumbs	1 (3.57%)	0 (0%)
Lower Limb		
Thigh	1 (3.57%)	1 (7.69%)
Knee	6 (21.43%)	1 (7.69%)
Ankle	5 (17.86%)	2 (15.38%)
Feet/Toes	2 (7.14%)	1 (7.69%)
Other Body Parts		
Head (Face, Nose, Mouth)	3 (10.71%)	0 (0%)

Body parts injuries experienced by Kabaddi athletes are classified into upper body, lower body, and other body parts. According to Table 4, classification of injured body parts, injuries to the wrist (14.29%) and the shoulder/clavicle and upper arm (7.14%) are the most frequent injuries to male Kabaddi athlete upper bodies. In the lower body parts, the most common injuries happened to the knees (21.43%) and ankles (17.86%). While to other parts of the body, it commonly happened to the head (face, nose, mouth) [10.71%]. Whereas, in female Kabaddi athletes, the most injuries occurred to the upper body, namely to the shoulder/clavicle (30.77%), while in the lower body the injury occurred to the ankle (15.38%).

**DISCUSSION**

The purpose of this study was to identify sport injuries, types of sport injuries, and body parts injured in Indonesian Kabaddi players. Injuries experienced by Indonesian Kabaddi athletes generally occurred during practice by 63.4%, while during matches by 36.6%. Injuries that occur keep the Kabaddi player out of matches or training or force the player to leave matches or training in between (ankle injuries, dislocated shoulders, knee ligament injuries, and muscle injuries)

(Gupta, Mohali, Kapoor, Patil, & Singhal, 2021).

The most common injuries come as a result of physical contact with other players, since Kabaddi is a sport that requires physical contact, particularly when raiders collide with defenders (Saha Gopa, 2022). Kabaddi athletes who play in the defender position are more likely to get upper body injuries such as neck/spine injuries, sternum/rib/back injuries, abdomen injuries, pelvic injuries, shoulder/clavicle injuries, upper arm injuries, wrist injuries, and hand/finger injuries. When a defender catches an opposing team raider, the defender performs blocking skills by running, turning, and attacking, blocking the raider in place with a small skipping motion (Pal & Kumar, 2020). The wrist is one of the most vulnerable parts of the body and can be broken by irregular movements; sometimes defenders deliberately step on raiders' wrists to prevent them from going any further, and that is an obvious and intentional cause of injury (Yallappa, 2020a).

Lower body injuries, such as hamstring, knee, ankle, and foot injuries, are the most common in Kabaddi games. This is consistent with study by Pal, Kalra, Kumar, Pawaria, and Rishi (2020), who found that knee injuries were common among raiders and defenders, while ankle injuries were the most common in Kabaddi sports. In this study, lower body injuries were typically sustained by raiders. A raider must be quick and agile due to the fact that Kabaddi is an extremely active sport with explosive movements (Torbatinezhad, Daneshmandi, Tabatabaeinezhad, Ex-, & Tabatabaeinezhad, 2019). Other movements like kicking and jumping can sometimes make a raider frequently wrong in resting or landing, especially if he has been caught by a defender. The possibility of injury is increased because he must try to escape from being locked or caught by a defender while in a difficult space of movement. Raiders must use twisting and abrupt movements to escape from defenders. Rapid and reflexive movements to start, stop, bend, rotate, and change direction applying extreme forces to the knee resulting in injury to the ligaments (Pal et al., 2020).

In Kabaddi, the explosive strength of the shoulders and legs is the most dominating variable for carrying out the movements as mentioned above, as evidenced by various literature, one of which is Bhavya, (2021) which states that the explosive strength of the shoulders and legs is the most dominating variable, both related to

the ability to kick and jump as well as those related to fast movements when riding and blocking with precision and ease. Injuries to other body parts, such as the head, face, nose, and mouth, result from a forceful impact with the opponent's other body parts. The face and head injuries sustained in Kabaddi sport are the most agonizing (Yallappa, 2020a).

According to the survey results in this study, the most prevalent injuries in male Kabaddi competitors are to the lower body, specifically knee and ankle injuries. In female Kabaddi athletes, the most common injuries are to the upper body, with the shoulder/clavicle being the most commonly injured. This is in line with Sen J's analysis, that the upper limb (51%) is more vulnerable than the lower limb (46%) in female Kabaddi athletes (Pal & Kumar, 2020). In comparison to male players, female players have greater lower extremity flexibility (Cejudo, 2021).

In Indonesia, the most common injuries suffered by male Kabaddi athletes were knee injuries (21.43%) and ankle injuries (17.86%), whereas women suffered knee injuries (7.69%) and ankle injuries (15.38%). Male and female raiders have distinct movement intensities, with male Kabaddi athletes' movements being more explosive than women's, while female Kabaddi athletes normally play more relaxed and measured. The anatomy and physiology of male and female ankles are also different. According to Otsuki et al. (2015), the ankle joint angle in plantar flexion is larger in women than in men. Injuries to the upper body are more common in female Kabaddi athletes than in males, owing to the smaller size of female shoulders in general. Shoulder instability in females is higher than in males due to glenoid morphology in females with an oval shape (tall and thin) have a high risk of shoulder instability (Cordelia, Lloyd, Anthony, & William, 2019).

The results of this study are intended to assist Kabaddi athletes and coaches in Indonesia in preventing and overcoming injuries suffered by their athletes, as injuries can have an impact on athlete performance. Athletes with a history of injury are classified as "high-risk athletes," which means they are at a high risk of suffering another injury to any part of their body (Tashiro et al., 2022). Researchers are aware of some of the study's limitations, which include: 1) the small number of samples because Kabaddi is still not extensively practiced in Indonesia; and 2) researchers only utilized

a questionnaire instrument, so they could not directly observe and assess injuries reported by athletes.

## CONCLUSION

This study demonstrates the fact that the most common injuries to male Kabaddi athletes in Indonesia are injuries to the lower body, specifically the knee and ankle, while the most common injuries to female Kabaddi athletes are injuries to the upper body, specifically the shoulder/clavicle. As a result, we recommend Kabaddi trainers in Indonesia to pay more attention to the training programs and prepare strategies to prevent injuries that might occur.

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## CONFLICT OF INTEREST

The authors declared no conflict of interest.

## REFERENCES

- Alghadir, A. H., Iqbal, Z. A., Iqbal, A., Ahmed, H., & Ramteke, S. U. (2020). Effect of chronic ankle sprain on pain, range of motion, proprioception, and balance among athletes. *International journal of environmental research and public health*, 17(15), 5318.
- Bhavya, S., & Hanumanthayya, P. (2021). Influence of physical and psychological variables on playing ability of kabaddi. *IJRAR-International Journal of Research and Analytical Reviews (IJRAR)*, 8(2), 51-55.
- Carter, C. W., Ireland, M. L., Johnson, A. E., Levine, W. N., Martin, S., Bedi, A., & Matzkin, E. G. (2018). Sex-based differences in common sports injuries. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*, 26(13), 447-454.
- Cejudo, A. (2021). Lower extremity flexibility profile in basketball players: Gender differences and injury risk identification. *International journal of environmental research and public health*, 18(22), 11956.
- Gupta, R., Kapoor, A., & DavidMasih, G. (2020). Prevalence of concomitant knee injuries associated with anterior cruciate ligament tear in kabaddi and football players. *Journal of clinical orthopaedics and trauma*, 11, S784-S788.
- Gupta, R., Kapoor, A., Patil, B. M., Singhal, A., & Malhi, M. (2021). Suggestions to improve shortcoming in reporting and data collection procedure for studies of injuries in Kabaddi. *Journal of Arthroscopic Surgery and Sports Medicine*, 3(1), 3-6.
- Harry, A., & George, A. (2021). Effectiveness of Muscle Energy Technique on Improving Hamstring Muscle Flexibility in High School Level Kabaddi Players. *International Journal of Research and Review*, 8(6), 133-139.
- Hickey, J. T., Opar, D. A., Weiss, L. J., & Heiderscheit, B. C. (2022). Hamstring strain injury rehabilitation. *Journal of athletic training*, 57(2), 125-135.
- Johnson, R. M., Tewari, N., Haldar, P., Mathur, V. P., Srivastav, S., Bansal, K., & Rahul, M. (2023). Prevalence and pattern of traumatic orofacial injuries in Kabaddi players in Delhi-NCR region. *Injury*.
- Otsuki, T., Maeda, S., Mukai, J., Ohki, M., Nakanishi, M., & Yoshikawa, T. (2015). Association between plasma sLOX-1 concentration and arterial stiffness in middle-aged and older individuals. *Journal of clinical biochemistry and nutrition*, 57(2), 151-155.
- Pal, S., Kalra, S., Kumar, S., Pawaria, S., & Rishi, P. (2020). A Literature Review on Common Injuries and Their Prevention in Kabaddi. *European Journal of Sports & Exercise Science*, 9(1), 01-09.
- Pal, S., Kumar, S., Sharma, A., & Thariwal, S. (2020). Prevalence of Injuries in National Level Kabaddi Players in India-A Cross-sectional Survey. *Journal of Clinical & Diagnostic Research*, 14(9).
- Park, K., & Kim, P. D. C. (2020). Injuries in Elite Korean Kabaddi Athletes : A Epidemiological Study, 15(2), 57-63.
- Pawar, S. B., & Borkar, P. (2018). Effect of ladder drills training in female kabaddi players. *International Journal of Physical Education, Sports and Health*, 5(2), 180-184.
- Mohanakrishnan, R., & Murukesan, K. (2021). Comparative analysis of playing ability in selected offensive skills of intercollegiate men kabaddi players. *Elementary Education Online*, 20(5), 7507-7507.
- S Saha, G. (2022). A Comparative Study on Explosive Strength and Reaction ability between Female Kabaddi and Kho Kho Players. *J Adv Sport Phys Edu*, 5(6), 123-128.
- Shobha, R., & Jyoti, D. M. (2022). Comparison of reaction ability among state, university and sub junior national level female Kabaddi players of Bengaluru.

- International Journal of Physiology, Nutrition and Physical Education, 7(1), 95-98.
- Subba, A., & Choudhury, A. A case study on sports injuries of kabaddi players of Tripura, India. *Strain*, 9, 36.
- Urabe, Y., Komiya, M., Ishihara, H., Mizuta, R., Fukui, K., Tsutsumi, S., ... & Tashiro, T. (2022). Factors Associated with Injuries and Gender Differences in Japanese Adolescent Athletes Returning to Sports Following the COVID-19 Restriction. *Journal of Men's Health*, 18(8), 175.
- Torbatinezhad, Z., Daneshmandi, H., & Tabatabaeinezhad, S. M. (2019). The effect of selected core stability and hopping exercise on trunk endurance and balance of female kabaddi athletes. *Physical Treatments-Specific Physical Therapy Journal*, 9(2), 125-136.
- Yallappa, M. (2020). A study on common injuries of Kabaddi players. *International Journal of Physical Education, Sports and Health*, 7(3), 37-43.
- Yallappa, M. (2020). Relationship of selected physical, anthropometrical and physiological parameters to performance of university male kabaddi players. *Journal of Sports Science and Nutrition*, 1(2), 01-04.