

**Types of Injury Experienced by Rugby Athletes in Indonesia****Nur Luthfiatus Solikah<sup>1\*</sup>, Tommy Apriantono<sup>1</sup>, Nurhasan<sup>2</sup>**<sup>1</sup>Department of Sports Science, Institut Teknologi Bandung, Bandung, Indonesia<sup>2</sup>Fakultas Ilmu Olahraga, Universitas Negeri Surabaya, Surabaya, Indonesia**Article Info***Article History :**Received December 2022**Revised February 2023**Accepted March 2023**Available online April 2023**Keywords :**athletic injuries, rugby Athletes, sports medicine***Abstract**

Rugby is a popular sport categorized as a physical game with a high level of physical contact and significant injury risk. The purpose of this study was to find out and describe the type of injury suffered by Rugby athletes in Indonesia. This quantitative descriptive research was conducted by evaluating male rugby athletes (N = 62) experiencing injury using a questionnaire. The questionnaire questions focused on anthropometry, age when experiencing the injury, causes of injury, anatomical injury, and types of injury. The anthropometry analysis result of the Rugby athletes aged 16-30 years showed that they had an ideal body mass index (16-20 years =  $21.0 \pm 2.8$  vs 21-25 years =  $23.2 \pm 1.3$  vs 26-30 years =  $25.9 \pm 1.0$ ). The common injuries found in Rugby athletes was acute injuries (56%) compared to overuse injuries (44%). The result also showed that 65% of 62 players suffered a lower limb injury, only 35% of the 62 players suffered an upper limb injury. In general, 53% of 62 players suffered ligament injury, where 31% of injury occurred in the Knee. The cause of injury suffered by Rugby players was physical contact with opponents. The data described that 50% of 62 players suffered injuries due to physical contact. This study indicates that physical contact is a common cause of injury to Rugby athletes, while the type of injury that often occurs is a ligament injury where the lower limb becomes the most common injury. As they get older, the risk of injury in Rugby athletes in Indonesia is increasing.

## INTRODUCTION

Rugby is one of the most widely-played physical contact sports in the world, with competitions taking place in over 120 countries (Freitag, et al., 2015). Rugby is classified as a physical game sport that has the character of physical contact and high energy level through out the play with provisions for acceleration, deceleration, changes in direction, and collisions between players (Crichton et al., 2012; Johnston et al., 2014). Rugby has a higher risk of injury than other team sports with comparable movements since it is a physical contact activity (Palmer-Green, et al., 2015). Rugby has a 4 times higher injury rate than semi-contact team sports like football, with possibly more serious injuries (Piggin & Bairner, 2019). Both amateur and senior professional Rugby have recorded injury incidence and severity, with the consensus that injury rates increase with the competitive level of the game (Palmer-Green, et al., 2013).

The majority of Rugby injuries are typically brought on by direct contact between players (Cruz-Ferreira, et al., 2018). Rugby's tackle is regarded as its most dangerous play-area, but other elements of the game, including the maul, scrum, and ruck, also carry a risk of injury (Whitehouse et al., 2016; Fuller et al., 2017). Given that Rugby players must use physical strength and physical contact, it is difficult to completely eliminate the risk of injury in this sport (Kerr, 2021). According to a number of earlier studies, Rugby injuries are caused by the conditions experienced by the players during practices and matches. These conditions result in a transfer of energy that exceeds the human body's capacity to maintain body structures and functions, which results in missed opportunities to play Rugby in the future (Fitzpatrick, et al., 2018; Brown et al. 2019).

According to Willigenburg et al. (2016), the injury rate for Rugby players during games can reach 81/1000 hours, while it is up to 3/1000 hours during practice. McIntosh et al. (2010) recorded every injury occurrence suffered by players in every age group and elite in Australia, with the hamstring (18.2%), knee (15.2%), shoulder (13.6%), head (12.1%), ankle (9.1%), arm (6%), elbow (4.5%), and the unexpected (7.6%). Meanwhile, Puckree (2014) discovered that injuries in student Rugby athletes occur in the lower extremities for the knee (25%), ankle (21%), and upper extremities for the

shoulder (15%), and back (3%) injury.

Injury monitoring is critical for determining the risk of injury during Rugby matches and training. To effectively manage injury risk, comprehensive injury surveillance at all levels is required to identify the mechanisms of injury as well as associated risk factors (Gabbett et al., 2012). There has been no research to date on the characteristics, risks, and types of injuries experienced by Rugby players in Indonesia. The data gathered will be added to the literature on the rapidly expanding sport of Rugby in Indonesia. As a result, the purpose of this research is to identify and describe the types of injuries experienced by Rugby players in Indonesia. So that researchers may assist players, coaches, and medical personnel in developing and implementing techniques for monitoring and preventing injuries to Rugby players in Indonesia.

## METHODS

This research is a quantitative descriptive study in which the researcher seeks information from respondents without administering a treatment, which was accomplished through the use of a questionnaire. The study was conducted between July and August of 2022.

### Participants

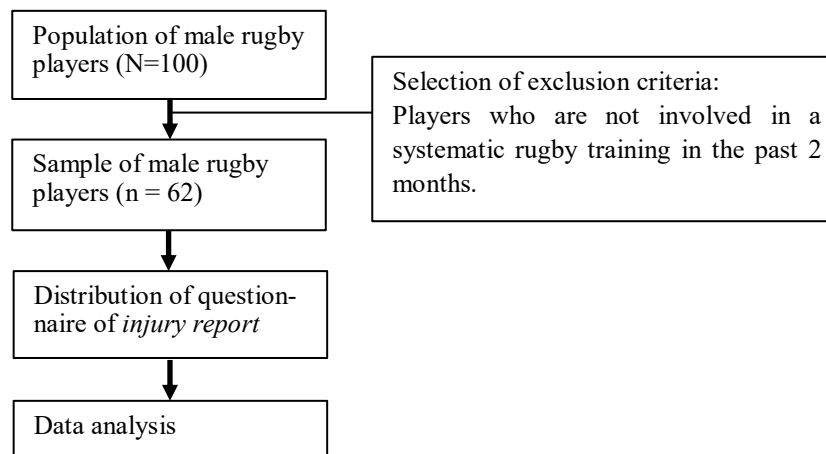
The population of this study were male Rugby players in Indonesia (N=100). The sample selection was based on the inclusion criteria that the researchers had determined, namely (1) Rugby players who had or were currently experiencing injuries, (2) players who had at least an experience competing at the national level. While the exclusion criteria were (1) players who were not involved in a systematic Rugby training in the last 2 months. The sampling technique used was purposive sampling.

### Procedure

The After being selected based on the criteria set by the researcher, (n=62) participants met the inclusion criteria to be the part of the study. Questionnaire was distributed to participants online using the Google form, while the focus of the questions included anthropometric data and injury reports. Participants' height and weight were used as anthropometric data queries. In terms of the injury report, the questions include the age of the injury, the cause of the injury, the anatomical

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

Question Item	
Anthropometric	What is your height? ....(cm) What is your weight? ....(kg)
Injury Report	Is the injury an acute or overuse type of injury? When does the injury happen? What type of injury do you have? Which part of body are you injured in? According to the examination, what was the cause of the injury?



**Figure 1.** Research Design

injury, and the kind of injury. These questions referred to Fuller et al. (2017). Table 1 displays these questions. Figure 1 depicts the research design.

**RESULT**

Table 2 shows the injuries experienced by (n=62) Rugby players in Indonesia. Anthropometric results revealed that Rugby players ranged in age from 16 to 30 years. Players between the ages of 16 and 30 have an optimal body mass index (BMI) (16 – 20 y.o = 21.0 ± 2.8 vs 21 – 25 y.o = 23.2 ± 1.3 vs 26 – 30 y.o = 25.9 ± 1.0).

According to the findings of this study, athletes sustained injuries at all ages, and as they become older, they suffer more injuries, both mild and catastrophic (16 – 20 y.o = 18.2 ± 1.3 vs 21 – 25 y.o = 22.1 ± 1.7 vs. 26-30 y.o = 26.2 ± 1.0). According to the results of this survey, acute injuries (56%) were more common than overuse injuries (44%). As shown in Table 3,

participants between the ages of 26 and 30 were more likely to have overuse injuries (57%) than acute injuries (43%).

In addition, Table 4 shows that 65% of the participants had lower extremity injuries, whereas only 35% of the 62 players had upper extremity injuries. As for the type of injury found in this study, 53% of the 62 athletes had more ligament injuries, as shown in Table 5.

Rugby players sustained injuries to their knee (31%), ankle (27%), shoulder (15%), head (11%), hand (10%), hip/groin (3%), and low back (3%). Overall, injuries to Rugby players were more prevalent in the knee, as illustrated in Figure 2. Further, Figure 3 depicts the causes of injuries from the present study. In general, injuries occurred as a result of physical contact with opponents (50%). However, 47% of 14 Rugby players aged 26 to 30 were injured as a result of over-play as the primary cause of injury.

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

Age range (years)	Number of Players	Height (Cm)	Weight (Kg)	BMI (Kg/m2)
16 – 20	10	169.2 ± 4.8	60.2 ± 11.6	21.0 ± 2.8
21 – 25	38	170.2 ± 4.9	69.9 ± 12.4	23.2 ± 1.3
26 – 30	14	169.6 ± 4.1	73.0 ± 9.8	25.9 ± 1.0

**Table 3.** Age group distribution of first injury and classification of injuries

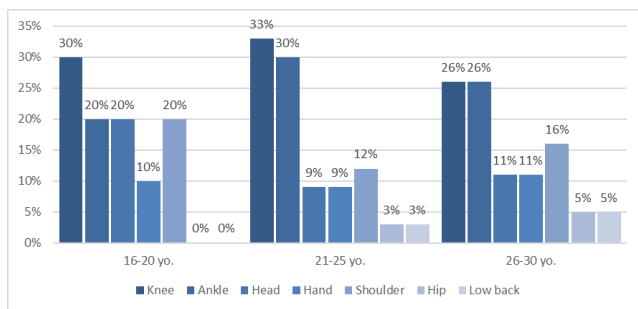
Age range (years)	First age injured (years)	Injury Classification	
		Acute	Overuse
16 – 20	18.2 ± 1.3	7	3
21 – 25	22.1 ± 1.7	22	16
26 – 30	26.2 ± 1.0	6	8

**Table 4.** Anatomical distribution of injuries

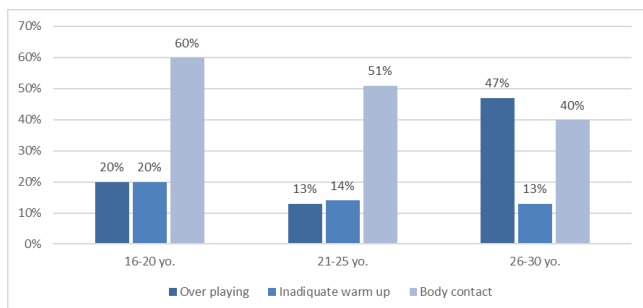
Age range (years)	Anatomical Injuries	
	Lower Limb	Upper Limb
16 – 20	4	6
21 – 25	28	10
26 – 30	8	6

**Table 5.** Types of Injury

Age range (years)	Type of Injury					
	Ligament	Tendinosis	Dislocation	Fracture	Concussion	Cartilage
16 – 20	5	0	2	1	2	0
21 – 25	18	5	6	2	3	2
26 – 30	10	3	0	1	2	0



**Figure 2.** Injury Body Part



**Figure 3.** Common Reason for injury

**DISCUSSION**

From the results of this study, researchers were able to uncover several facts about injuries to Rugby players in Indonesia. The study's findings include: (1) that the risk of injury to Rugby players in Indonesia increased with age; (2) that acute injuries (56%) were more common than overuse injuries (44%); (3) that the lower extremities were the most common part of the body to get injured; (4) that Rugby players in Indonesia typically sustained various ligament injuries; (5) that injuries to the knee (31%) were more frequent in all age ranges; and (6) that physical contact was a common cause of injury.

Based on these findings, this study confirms earlier studies that claim the knee is the most commonly damaged area of the body. Montgomery et al. (2018) discovered that 57% of Rugby players suffered ACL injuries as a result of physical contact, and ball carriers were at a higher risk of ACL injuries. It

is comparable to the findings of this study in that physical contact constitutes one of the risks of injury. Meanwhile, another study by Montgomery et al. (2019) discovered that shoulder injuries occurred frequently during tackling (49%), ruck/maul (26%), open play (15%), scrum (8%), and foul play (3%).

In contrast to Della Villa et al.'s research (2021), which revealed that 68% of ACL injuries in professional male Rugby players happened as a result of no physical contact and 32% as a result of physical contact, the majority of which occurred when attacking rather than defending. In addition to physical contact, the findings of this study revealed that player exhaustion and insufficient warm-up become factors in the occurrence of injuries. Tee et al. (2019) state that ligament injuries are the most common and frequently occur in round 2, and that player fatigue is the risk factor. Furthermore, pre-match warm-ups are recommended to reduce the risk of injury (Chalmers et al. 2011). If the warm-up is not performed effectively, it will interfere with the flexibility of the muscles and will have a detrimental impact on muscle readiness to meet the demands of movement, increasing the risk of injury.

Research by Ball et al. (2017) indicated that Rugby players frequently suffered injuries to their lower extremities (51.8%), with joint and ligament damage being the most frequent type of injury (29.5%). These data are consistent with those of earlier research, which found that muscular injuries and sprains were the most frequent types of injuries (Holtzhausen, et al., 2006; Solis-Mencia, et al., 2019). In contrast to Leung et al.'s (2017) study that found upper extremity injuries were more frequent than lower extremity injuries, other studies found that lower extremity injuries were more common, with the knee contributing to the majority of injuries across all age groups (31%), and this was due by muscle fatigue. Meanwhile, the upper extremity became the main factor contributing to the shoulder (15%) due to physical contact during the game (Barden & Stokes, 2018). However, Usman & McIntosh (2013) confirm that the level of injuries that occur to the shoulder will decrease as the level of play increases, these results indicate that there is a relationship between injury and level of play.

This study demonstrates that ligament injuries are the most frequent type of injury. According to Fitzpatrick et al. (2018), ligament injuries greatly outnumber

all other types of injuries. Joint/ligament injuries (34/1,000 hours) are the most common time lost injuries among professional Rugby union players (Hunzinger et al. 2021). The results of this study also showed that players who are older had a higher chance of injury. The findings of this study corroborate those of Edwards et al. (2017), who found that there are risk factors for injury that increase with age. Rugby players in the front position have a higher risk of injury, according to Orr & Cheng's (2016) research. Another intriguing conclusion from this study is that overuse injuries affect players more frequently (57%) than acute injuries do (43%), and that among 14 Rugby players aged 26 to 30 years, 47% of injuries are caused by over playing.

It is intended that this research will assist clarify and describe the types and risks of injury in Rugby so that players and coaches may develop injury prevention measures. The researcher recognized certain flaws in this study, such as (1) the researcher did not assess the injury survey for female Rugby players and (2) the researcher solely utilized a questionnaire instrument and did not conduct a direct measurement to see injuries encountered by Rugby players. Some of these limitations are expected to be addressed by future research, which will supplement the findings obtained in this study.

## CONCLUSION

This study provides evidence that the risk of injury among Rugby players increases with age. Parts of the body in the lower extremities are those of frequently injured. Physical contact is one of the most prevalent causes of injury, with ligaments being the most commonly injured. The findings of this study might encourage male Rugby players to pay greater attention to a proper warm-up routine in order to reduce the chance of injury. The warm-up phase begins with activities that can increase vascularization by using explosive dynamic exercises and articular mobility exercises. This stage is used to increase muscle temperature and increase flexibility. In addition, trainers are expected to be able to provide training programs and prevention strategies against the risk of injury.

## CONFLICT OF INTEREST

The authors declared no conflict of interest.

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