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Analysis of Athletes' Knowledge Level About Injury Risk in Fencing at Kudus Regency

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Keywords

Knowledge level, injury risk, fencing, athletes, Kudus Regency

Abstract

This study aims to analyze fencing athletes' knowledge level regarding injury risk in Kudus Regency. Using a quantitative descriptive survey method, 25 athletes were selected through purposive sampling from a population of 30 IKASI-registered athletes. A 40-item questionnaire adopted from Kurniadi (2024) was used (validity 0.520; reliability 0.750). Data were analyzed descriptively using SPSS-23. Results showed overall knowledge was in the fair category (mean 28.00/40 or 70%): 44% good, 44% fair, and 12% poor. By indicator: sports injury knowledge was good (48% good, 44% fair, 8% poor); injury handling knowledge was fair (44% good, 52% fair, 4% poor); injury prevention knowledge was critically poor (100% poor). The conclusion is that fencing athletes' overall injury risk knowledge is fair, but injury prevention knowledge is very low. Systematic and continuous education involving coaches, clubs, and sports administrators is recommended.

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INTRODUCTION

Sport is a physical activity carried out in a planned, systematic, and sustainable manner with the aim of improving physical fitness, health, and developing an individual's physical, mental, and social potential (Pranata, 2022). In its development, sport not only serves as a means of recreation but has also become part of a structured achievement development system (Hasan et al., 2025). Athletes are required to undergo measurable training programs to achieve optimal performance in competitions. Athletic achievement is influenced by various factors, including physical condition, technique, tactics, mentality, as well as understanding of safety aspects during training and competition.

One sport that demands high physical and mental abilities is fencing. Fencing requires speed of reaction, movement coordination, accuracy, and agility in attacking and defending. This sport is rooted in the martial art using weapons which later developed into a modern sport and was officially competed at the 1896 Athens Olympics (Isnaini and Decheline 2022; Zahara & Mahendra 2022). In fencing, athletes use three types of weapons: foil, epee, and sabre, each with different characteristics and techniques (Dessy 2021).

As a sport involving rapid movement, sudden changes of direction, and interaction with weapons, fencing has a fairly high potential risk of injury. A recent systematic review and meta-analysis published in the Clinical Journal of Sport Medicine (2025) reported that the prevalence of injuries in able-bodied fencing athletes ranges from 51.5% to 92.8%, with professional athletes having a higher injury rate than non-professional athletes. The most frequently injured body regions are the lower extremities (knee and ankle), followed by the upper extremities (wrist, hand, and fingers). Injuries can occur due to technical errors, improper warm-up, use of inappropriate equipment, as well as lack of physical and mental readiness of the athlete (Nurhidayat et al. 2024).

Knowledge of injury risk is an important factor in sports injury prevention. Athletes who have a good level of knowledge about the types of injuries, causes, and prevention methods tend to be more able to apply safe behavior during training and competition (Hardyanto, 2018). This knowledge includes understanding the importance of warm-up, use of protective equipment, correct movement techniques, as well as initial injury handling procedures. Research shows that proper active warm-up and eccentric exercises for the hamstring muscles can improve performance while reducing the risk of injury in fencing athletes.

Fencing development in regional areas still faces various challenges, especially in terms of facilities, sports safety education, and athlete understanding of injury risk (Prabu, Hidayah, & Nasuka 2021). Compared to other popular sports, fencing is still relatively unknown to the wider community. This condition has an impact on limited access to information, coaching, and education related to sports safety for fencing athletes.

Based on initial observations conducted on fencing athletes in Kudus Regency, it was found that there is still variation in the level of athlete understanding of injury risk, including aspects of prevention, use of protective equipment, and initial injury handling. The information obtained indicates that education on injury risk has not been carried out optimally and systematically by clubs or sports administrators such as KONI Kudus Regency. This indicates a gap between the need for sports safety knowledge and the actual conditions in the field.

Ideally, every fencing athlete has a good level of knowledge about injury risk, which includes understanding of the types of injuries, causes, prevention, and initial injury handling. With good knowledge, athletes are expected to be able to apply safe behavior during training and competition, use protective equipment correctly, and perform optimal warm-up and cool-down (Nurhidayat et al. 2024). In addition, coaches and clubs should provide systematic and sustainable sports safety education programs.

Previous research on injury risk knowledge in sports is still limited. Most previous studies were conducted on popular sports such as soccer, futsal, and basketball (Okta & Hartono 2020; Yasin et al. 2025). Research on injuries in fencing has also focused more on aspects of injury epidemiology and risk factors, while studies on the athletes' own knowledge level of injury risk, especially at the regional level, are still very limited.

Based on the description above, the novelty of this research is: (1) specifically examining fencing athletes at the regional level (Kudus Regency) which has rarely been the object of research; (2) analyzing the level of injury risk knowledge separately per indicator (knowledge about injuries, injury handling, and injury prevention); and (3) providing practical contributions for coaches and KONI in developing more targeted and specific safety education programs for the sport of fencing.

Therefore, this research is important to be conducted to analyze the level of knowledge of fencing athletes regarding injury risk, identify influencing factors, and provide a scientific basis for the development of coaching programs, safety education, and more specific injury prevention strategies in fencing at Kudus Regency.

Kudus Regency was selected as the research site because it is one of the regions in Central Java with an active fencing program, as evidenced by its participation in various regional and national championships. However, athletes' knowledge of injury risks, particularly regarding prevention, has not yet been systematically studied.

Knowledge is an important foundation, but it is not the sole determinant of safe behavior. Studies show that habits, coach supervision, and the training environment also influence the translation of knowledge into actual action. Therefore, assessing knowledge levels should be viewed as the first step-not the final one-in injury prevention efforts.

METHODS

This research uses a quantitative approach with a descriptive survey type. According to Sugiyono (2018), quantitative descriptive research is used to describe data that has been collected as it is . The descriptive method aims to describe or illustrate phenomena that occur without manipulating research variables . The research was conducted in Kudus Regency for one month, coinciding with the Training Center program for fencing athletes in preparation for the PORPROV (Provincial Sports Week) competition. The research population consisted of all fencing athletes registered with IKASI (Indonesian Fencing Association) of Kudus Regency, totaling 30 athletes, while the sample was 25 athletes selected using purposive sampling technique with the criterion of being active athletes prepared to participate in the competition . The research variable is the athletes' level of knowledge about injury risk, measured through three indicators: knowledge of sports injuries, knowledge of injury handling, and knowledge of injury prevention. The instrument used was a questionnaire adopted from Kurniadi (2024) consisting of 40 statement items that had been tested for validity (0.520) and reliability (0.750), thus declared feasible to use. Data collection techniques were carried out through direct questionnaire distribution and supported by documentation as complementary data. Data analysis used descriptive statistics with the help of SPSS-23 software, including calculations of mean, median, standard deviation, minimum, maximum, and indicator-based analysis.

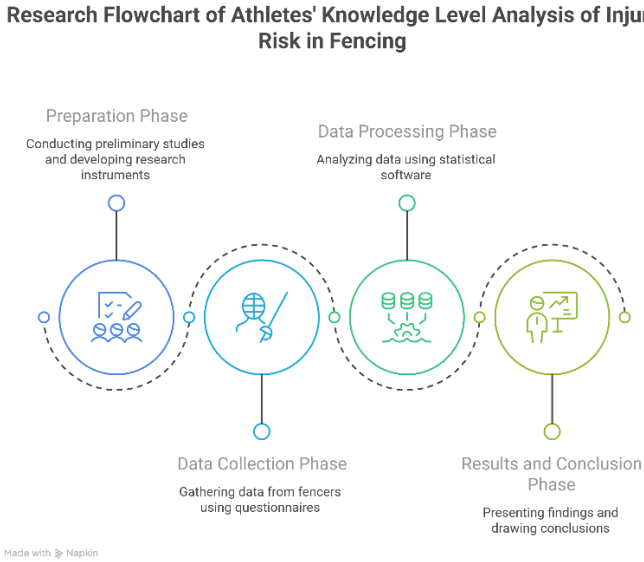

Figure 1. Flowcarts of Athletes' Knowledge Level Analysis of Injury Risk in Fencing

RESULTS AND DISCUSSION

Descriptive Statistics

The results of the descriptive statistical analysis of fencing athletes' knowledge level about injury risk in Kudus Regency are presented in the following table 1:

Table 1. Descriptive Statistics of Fencing Athletes' Knowledge Level

Statistic	
N	25
Mean	28.00
Median	29.00
Std. Deviation	7.200
Minimum	16
Maximum	38

Based on **Table 1**, it is known that the number of respondents (N) in this study was 25 athletes. The mean value obtained was 28.00 out of a maximum score of 40, with a median of 29.00. The standard deviation of 7.200 indicates that the variation in scores among athletes is quite high. The lowest score (minimum) achieved by athletes was 16, while the highest score (maximum) was 38.

Distribution of Fencing Athletes' Knowledge Level

Table 2. Distribution of Fencing Athletes' Knowledge Level About Injury Risk

Knowledge Level	Score Range	Frequency (n)	Percentage (%)
Good	30-40	11	44.0%
Fair	20-29	11	44.0%
Poor	<20	3	12.0%
Total		25	100%

Based on the table above, it is known that the knowledge level of fencing athletes in Kudus Regency regarding injury risk is evenly distributed between the good and fair categories, with 11 athletes (44.0%) each. Meanwhile, athletes with poor knowledge were only 3 athletes (12.0%) of the total respondents.

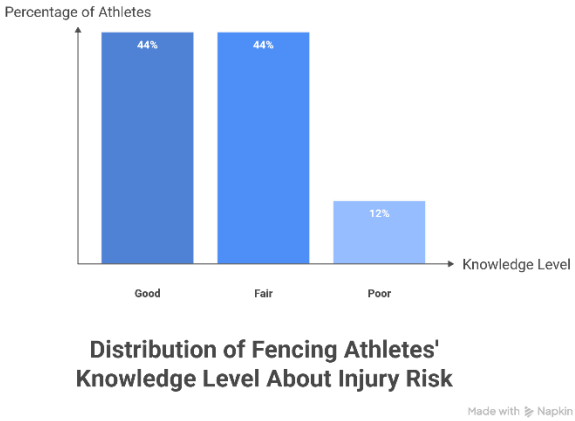

Figure 2. Bar Chart of Fencing Athletes' Knowledge Level Distribution

Descriptive Statistics of Sports Injury Knowledge Indicator

Figure 1 shows that the percentage of athletes with good and fair knowledge levels is equal at 44%, represented by two parallel bars of the same height. Meanwhile, the bar for the poor category only reaches 12%, indicating that athletes with low injury risk knowledge are a minority. This pattern suggests that, generally, fencing athletes in Kudus Regency have sufficient understanding of injury risk; however, education must still be delivered evenly to help all athletes reach the good category.

Table 3. Descriptive Statistics of Sports Injury Knowledge

Statistic	
N	25
Mean	13.56
Median	13.00
Std. Deviation	3.176
Minimum	7
Maximum	18

Based on **Table 3**, it is known that the number of respondents (N) for the sports injury knowledge indicator was 25 athletes with all data validated (missing = 0). The mean value obtained was 13.56 with a median of 13.00. This indicates that the data distribution tends to be symmetrical because there is no significant difference between the mean and median. The standard deviation of 3.176 indicates that the level of deviation or variation in scores among athletes is moderate. The lowest score (minimum) achieved by athletes was 7, while the highest score (maximum) was 18.

Descriptive Statistics of Injury Handling Knowledge Indicator

Table 4. Descriptive Statistics of Injury Handling Knowledge

Statistic	
N	25
Mean	8.40
Median	8.00
Std. Deviation	2.661
Minimum	3
Maximum	12

Based on **Table 4**, it is known that the number of respondents (N) for the injury handling knowledge indicator was 25 athletes with all data validated (missing = 0). The mean value obtained was 8.40 with a median of 8.00. There is no significant difference between the mean and median values, so the data distribution can be considered quite symmetrical. The standard deviation of 2.661 indicates that the variation in scores among athletes is low, meaning the data tends to cluster around the mean. The lowest score (minimum) achieved by athletes was 3, while the highest score (maximum) was 12.

Descriptive Statistics of Injury Prevention Knowledge Indicator

Table 5. Descriptive Statistics of Injury Prevention Knowledge

Statistic	
N	25
Mean	13.56
Median	13.00
Std. Deviation	3.176
Minimum	7
Maximum	18

Based on **Table 5**, it is known that the number of respondents (N) for the injury prevention knowledge indicator was 25 athletes with all data validated (missing = 0). The mean value obtained was 13.56 with a median of 13.00. The alignment between the mean and median indicates that the data distribution tends to be normal and does not show significant skewness. The standard deviation of 3.176 shows that the variation in scores among athletes is moderate, so there is still diversity of understanding among athletes. The lowest score (minimum) achieved by athletes was 7, while the highest score (maximum) was 18.

Frequency Distribution of Fencing Athletes' Knowledge Level per Indicator

Table 6. Frequency Distribution of Fencing Athletes' Knowledge Level per Indicator

Indicator	Good (n/%)	Fair (n/%)	Poor (n/%)
Sports Injury Knowledge	12 (48.0%)	11 (44.0%)	2 (8.0%)
Injury Handling Knowledge	11 (44.0%)	13 (52.0%)	1 (4.0%)
Injury Prevention Knowledge	0 (0%)	0 (0%)	25 (100%)

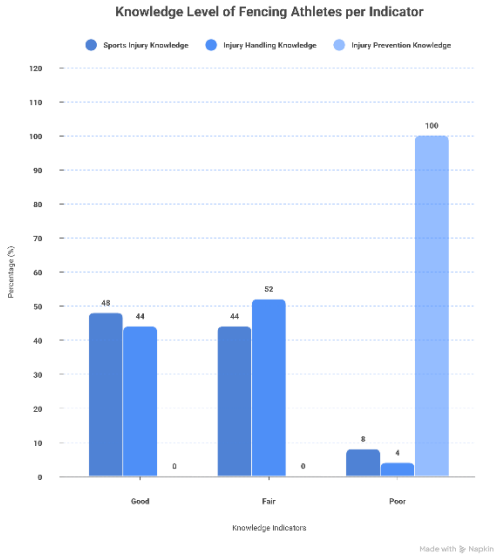

Figure 3. Bar Chart of Fencing Athletes' Knowledge Level per Indicator

Based on **Table 1** and Figure above, it shows that for the sports injury knowledge indicator, the majority of athletes were in the good and fair categories, accounting for 12 athletes (48.0%) and 11 athletes (44.0%) respectively, while only 2 athletes (8.0%) fell into the poor category.

Regarding the injury handling knowledge indicator, the fair category was predominant with 13 athletes (52.0%), followed by the good category with 11 athletes (44.0%), and the poor category with 1 athlete (4.0%). Furthermore, for the injury prevention knowledge indicator, all athletes (25 athletes or 100%) were categorized as poor. There were no athletes with injury prevention knowledge in either the good or fair categories.

Overall Knowledge Level of Athletes

The results showed that the average knowledge score of fencing athletes in Kudus Regency regarding injury risk was 28.00 out of a maximum score of 40 (70%) in the fair category. This finding is consistent with the research conducted by Shanti et al. (2023) on athletics athletes of PASI East Java, which showed that the average knowledge level of injury management among athletes was low, with the majority of athletes still believing in traditional treatment and not knowing first aid for injuries using the RICE method (Rest, Ice, Compression, and Elevation). The study also found that 44.70% of athletes did not know the conditions or characteristics of injuries, and 45.40% of athletes still did not understand the RICE injury management steps (Shanti et al. 2023).

Sports Injury Knowledge

Regarding the sports injury knowledge indicator, this study found that 12 athletes (48%) were in the good category, 11 athletes (44%) in the fair category, and 2 athletes (8%) in the poor category. These results indicate that most athletes have understood the types and causes of injuries in fencing.This is relevant to the findings of Sari and Pulungan (2019) on female futsal athletes of FIK UNIMED, which stated that sports injuries can occur due to internal factors, external factors, and overuse, and that proper management is necessary to prevent further injuries. Sports injuries are injuries to the integumentary, muscular, and skeletal systems caused by sports activities, which will be responded to by the body with signs of inflammation such as rubor (redness), tumor (swelling), calor (heat), and dolor (pain)(Sari &Pulungan 2019).

Injury Handling Knowledge

Regarding the injury handling knowledge indicator, this study found that the fair category dominated with 13 athletes (52.0%), followed by the good category with 11 athletes (44.0%), and the poor category with 1 athlete (4.0%). This finding indicates that athletes still need to improve their understanding of initial injury management procedures, especially the RICE method.

Research by Berbasis et al. (2026) on Kempo athletes in Riau actually showed better results, where 56 athletes (90.3%) had good knowledge of the RICE method, 5 athletes (8.1%) had moderate knowledge, and only 1 athlete (1.6%) had poor knowledge. This difference may be due to different

athlete characteristics and the intensity of education received by each group of athletes. Specifically, among Kempo athletes in Riau, the Rest indicator reached 85.5% good knowledge, Ice 82.3%, Compression 75.8%, and Elevation 80.6% (Berbasis et al. 2026). However, research by Pembayun et al. (2023) showed that the majority of athletics athletes (51.8%) rarely chose medical doctor treatment and preferred traditional medicine (50.4%). This indicates that there are still challenges in changing athletes' perceptions regarding medical injury management.

Injury Prevention Knowledge (Most Critical Finding)

The most concerning finding in this study was regarding the injury prevention knowledge indicator, where all athletes (25 athletes or 100%) were in the poor category. No athletes had injury prevention knowledge in either the good or fair categories.This finding is consistent with the research results of Muttaqien et al. (2020) on futsal athletes of KONI Makassar, which showed that before education (pre-test), the average score of athlete understanding was only 53.33 out of 100, and after education it increased to 80.01. This proves that systematic and continuous education is very necessary to improve athletes' understanding of injury prevention.

Research by The, et al. (2025) on young basketball athletes in Ternate City also showed similar results, where before counseling, 33% of participants had poor knowledge, 17% had fair knowledge, and only 50% had good knowledge. After being given counseling and training on the PRICE method (Protection, Rest, Ice, Compression, Elevation), the post-test results showed no participants with poor knowledge, 23% had fair knowledge, and 77% had good knowledge. This improvement indicates that the educational approach combined with practical training effectively improves participants' knowledge and skills (The et al. 2025).

Research by Fredianto & Noor (2021) also emphasized that injuries must receive treatment and medical attention as early as possible so that athletes do not experience more fatal injuries and can immediately return to physical activity, training, and competition.

Gap in Injury Prevention Knowledge

The finding that 100% of fencing athletes in Kudus Regency have poor injury prevention knowledge is very concerning because it contradicts the expected ideal condition. According to in Sari & Pulungan (2019), proper injury management includes four stages: Rest (resting the injured area), Ice (cold compress), Compression (pressure bandage), and Elevation (elevating the injured area). This method aims to stop bleeding, reduce swelling, and accelerate the healing process.

The importance of this knowledge is emphasized by research by Muttaqien et al. (2020) which states that proper treatment and effective prevention efforts can accelerate the recovery process and minimize the impact of injuries on athlete performance. The role of physiotherapy in sports provided to futsal teams includes promotive, preventive, curative, and rehabilitative services (Muttaqien et al. 2020).

Implications and Recommendations

Based on these findings, systematic and continuous educational interventions are needed for fencing athletes in Kudus Regency. Approaches that can be taken include:

First, counseling on the RICE/PRICE method combined with simulation and direct practice, as has been proven effective in the research by The et al. (2025) and (Muttaqien et al. 2020). Interactive educational methods that involve active participant participation can have a significant impact on their knowledge compared to providing only theoretical material.

Second, involving medical personnel and physiotherapists in athlete development programs, as recommended by Berbasis et al. (2026) that the involvement of athlete medical team nurses or emergency nurses is suggested to provide a better understanding of RICE-based injury management.

Third, continuous educational programs because good knowledge enables athletes to take correct initial actions, which can reduce inflammation and accelerate the recovery process (Berbasis et al. 2026).

In addition, a specific injury prevention protocol adapted from the FIFA 11+ for fencing-specific movements is recommended, including:

1. dynamic warm-up exercises with lunge and parry movements
2. strengthening exercises for the hamstring and quadriceps muscles
3. balance and proprioceptive exercises to prevent ankle injuries

4. cool-down with static stretching

Limitations of the Study

This study has several limitations. First, the sample was limited to 25 athletes from one regency, so the results cannot be generalized. Second, this study only measured knowledge levels, not the actual behavior of athletes in managing injuries. Third, the cross-sectional design only captured data at one point in time without observing changes after intervention. Further research with experimental design is needed to test the effectiveness of injury prevention education programs for fencing athletes.

CONCLUSION

Based on the results of the research and discussion, it is concluded as follows:

The overall knowledge level of fencing athletes in Kudus Regency regarding injury risk is in the fair category (mean 28.00/40 or 70%), with details of 11 athletes (44%) in the good category, 11 athletes (44%) in the fair category, and 3 athletes (12%) in the poor category.

Based on the indicator-based analysis:

Sports injury knowledge: in the good category (75.33%), with 12 athletes (48%) good, 11 (44%) fair, 2 (8%) poor. Injury handling knowledge: in the fair category (70.00%), with 11 athletes (44%) good, 13 (52%) fair, 1 (4%) poor. Injury prevention knowledge: 100% of athletes (25 athletes) are in the poor category — the most critical finding.

The low level of injury prevention knowledge indicates the need for systematic and continuous educational interventions, involving coaches, clubs, sports administrators, as well as medical personnel/physiotherapists. This study is limited to a sample of 25 athletes from one regency with a cross-sectional design, so the results cannot be generalized.

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