

## FIRST AID KNOWLEDGE OF SPORTS INJURIES OF EAST JAVACRICKET ATHLETES

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### ABSTRAK

Penelitian ini bertujuan menilai tingkat pengetahuan atlet cricket Jawa Timur mengenai pertolongan pertama cedera olahraga, dengan fokus pada metode PRICE, POLICE, dan PEACE & LOVE. Penelitian menggunakan pendekatan kuantitatif dengan desain deskriptif. Sampel berjumlah 20 atlet cricket Pra-PON Jawa Timur yang dipilih melalui teknik total sampling. Data dikumpulkan menggunakan kuesioner tertutup yang telah divalidasi, berisi 20 butir pertanyaan yang mencakup indikator setiap metode, meliputi identifikasi cedera, langkah awal penanganan, prinsip optimal loading, serta edukasi pemulihan, kemudian dianalisis menggunakan persentase dan korelasi Pearson. Hasil menunjukkan 70% atlet memiliki pengetahuan tinggi tentang pertolongan pertama cedera olahraga dasar. Pemahaman terhadap PRICE dan POLICE didominasi kategori sedang, masing-masing 80% dan 90%. Pada PEACE & LOVE, 50% berada pada kategori sedang, 45% tinggi, dan 5% sangat tinggi. Analisis korelasi menemukan hubungan positif signifikan antara pengetahuan dasar dengan pemahaman PRICE serta PEACE & LOVE. Temuan ini menegaskan bahwa fondasi pengetahuan yang baik mendukung pemahaman metode yang lebih komprehensif. Meski demikian, diperlukan pelatihan lanjutan yang terstruktur, terukur, dan berulang, berbasis simulasi kasus pertandingan, agar penguasaan metode kompleks lebih aplikatif di lapangan. Program pembinaan disarankan melibatkan pelatih dan tenaga medis untuk memastikan respons cepat, aman, dan konsisten, sekaligus menjaga keselamatan serta performa atlet secara optimal dalam jangka panjang.

**Abstract.** This study aimed to assess the level of knowledge among East Java cricket athletes regarding first aid for sports injuries, with a specific focus on the PRICE, POLICE, and PEACE & LOVE methods. A quantitative approach with a descriptive design was employed. The sample consisted of 20 East Java Pre-PON cricket athletes selected using a total sampling technique. Data were collected through a validated closed-ended questionnaire comprising 20 items that covered key indicators of each method, including injury identification, initial management steps, the principle of optimal loading, and recovery education. The data were analyzed using percentage techniques and Pearson correlation. The results showed that 70% of athletes had a high level of knowledge regarding basic first aid for sports injuries. Understanding of the PRICE and POLICE methods was predominantly in the moderate category, accounting for 80% and 90% of respondents, respectively. For the PEACE & LOVE method, 50% of

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athletes were in the moderate category, 45% in the high category, and 5% in the very high category. Correlation analysis revealed a significant positive relationship between basic first aid knowledge and understanding of the PRICE and PEACE & LOVE methods. These findings indicate that a strong foundational knowledge supports comprehension of more comprehensive injury management approaches. Nevertheless, structured, measurable, and repeated advanced training supported by match-based case simulations is needed to strengthen the practical application of complex methods in the field. It is therefore recommended that athlete development programs integrate education and hands-on training involving coaches and medical personnel to ensure fast, safe, and consistent responses, while supporting long-term athlete safety and performance.

## INTRODUCTION

Exercise and sport play a vital role in improving physical health, mental well-being, motor skills, and teamwork. Cricket is a sport that combines physical conditioning with technical mastery and tactical decision-making, all while demanding strong coordination among team members. However, like other competitive sports, cricket also carries an inherent risk of injury that can disrupt athletes' health and performance (Pardiwala et al., 2021). These risks increase when training loads are high and recovery is not well managed. For athletes, injuries are not just a physical setback but can also affect confidence and consistency in performance.

Sports injuries can occur during both training sessions and competition. They may result from direct impact, repetitive movement patterns, poor technique, or inadequate warm-up before activity. In cricket, injuries often appear due to sudden acceleration, rapid changes of direction, and high-force throwing or bowling actions. Common cases include muscle strains, ligament sprains, and fractures, sometimes triggered by collisions or excessive joint loading (Orchard et al., 2022). If not handled properly, acute injuries may progress into longer-term problems. Over time, this can limit participation and reduce overall athletic development.

Injury prevention is essential to maintain athlete readiness and long-term performance. Preventive strategies include structured warm-up routines, correct use of protective equipment, and training methods that match the athlete's capacity. Maintaining overall fitness, managing workload, and ensuring adequate rest are also key components of prevention. Alongside these measures, first aid knowledge is critical because early responses often determine the speed and quality of recovery. Athletes and coaches who understand basic injury management are better prepared to respond effectively when injuries occur.

Proper initial injury management includes approaches such as PRICE (Protect, Rest, Ice, Compression, Elevation) and more recent updates like POLICE and PEACE & LOVE. These methods emphasize protection and optimal loading while supporting recovery through appropriate early care. Evidence suggests that correct early-stage management can

reduce symptom severity, support tissue healing, and lower the risk of reinjury (Dubois & Esculier, 2021). In practice, this means knowing what to do immediately after an injury, and also knowing what actions should be avoided. Consistent application of these principles can help athletes return to training more safely and efficiently.

In sports coaching, performance-supporting factors are often grouped into internal and external domains. First aid knowledge and skills can be viewed as an external support factor because they relate to coaching readiness, medical access, and the quality of the surrounding support system. At the same time, athletes' awareness and ability to apply correct injury management reflect internal readiness and self-care capacity. Based on this rationale, the present study aims to assess the level of knowledge among cricket athletes in East Java regarding first aid for sports injuries. The results are expected to strengthen the practices of athletes, coaches, and stakeholders, supporting both health protection and performance sustainability in Indonesian cricket.

## **METHODS**

This study employed a quantitative approach with a descriptive research design to assess the level of knowledge among East Java cricket athletes regarding first aid for sports injuries. The research population consisted of 20 athletes from the East Java Pre-PON cricket team, including 11 male and 9 female players. Because the population size was relatively small, all athletes were included as research participants using a total sampling technique.

Data were collected using a validated, closed-ended questionnaire containing items that measured athletes' knowledge of first aid procedures. For each item, respondents selected one of the provided answer options, such as "yes" or "no." In addition to the questionnaire, interviews were conducted to enrich and confirm the findings obtained from the survey.

Data analysis used descriptive percentage techniques to determine athletes' knowledge levels. The study also adopted the statistical model proposed by Robin (2016), which assumes that scores from the sample can be used to estimate population scores under the assumption of a normal distribution. This model served as the basis for interpreting the results in a scientifically accountable manner.

The results were classified into five categories using the criteria adapted from Sudijandoko (2006), as presented in Table 1.

Table 1. Categorization Criteria

No	Formula	Category
1	$X \geq M + 1.5 SD$	Very high
2	$M + 0.5 SD \leq X < M + 1.5 SD$	Tall
3	$M - 0.5 SD \leq X < M + 0.5 SD$	Enough
4	$M - 1.5 SD \leq X < M - 0.5 SD$	Low
5	$X < M - 1.5 SD$	Very low

After categorization, the percentage for each category was calculated using the formula

$$P = \times 100\% \frac{F}{N}$$

where P is the percentage, F is the frequency in a given category, and N is the total number of respondents.

## RESULTS AND DISCUSSION

### Results

The respondents in this study were East Java cricket athletes who had participated in BK-PON. Data collection was conducted on December 21, 2024, and involved 20 respondents. Before presenting the main findings, the demographic characteristics of respondents are described to provide context, including age, height, weight, and gender (Table 2).

Table 2. Descriptive Statistics of Respondent Characteristics (East Java Cricket Athletes)

Characteristic	Mean	SD	Min	Max
Age (years)	22.2	2.23	19	29
Height (cm)	163.6	7.38	153	178
Weight (kg)	59.0	7.94	48	73

On average, respondents were 22.2 years old, with an age range of 19–29 years. The mean height was 163.6 cm, and the mean weight was 59.0 kg, which generally indicates a proportional profile for athletes.

Table 3. Gender Distribution of Respondents

Gender	Frequency	Percentage
Male	11	55%
Female	9	45%
Total	20	100%

The sample consisted of 55% male and 45% female athletes. Although the initial sampling target could not be fully optimized due to accessibility constraints, the final distribution still reflects a relatively balanced representation.

To better understand respondent characteristics, this study also examined the duration of cricket practice. Training duration may influence athletes' knowledge of sports injury management because longer involvement in sport increases the likelihood of experiencing injuries and gaining related learning, either directly or through coaching and medical support.

Table 4. Duration of Cricket Practice

<b>Duration of Practice</b>	<b>Frequency</b>	<b>Percentage</b>
< 2 years	4	20.0%
2–5 years	9	45.0%
> 5 years	7	35.0%
Total	20	100.0%

Most respondents had progressed beyond the basic stage of cricket participation. Nearly half (45%) reported 2–5 years of practice, while 35% had practiced for more than 5 years, and 20% had less than 2 years of experience. This profile is important because longer training experience is typically associated with stronger technical maturity and a broader exposure to injury situations, which can contribute to better first aid awareness.

Athlete experience is also shaped by competition exposure, as match conditions often increase injury risk and require practical responses to injury events. Therefore, competition participation reflects both the intensity of involvement and the potential for learning injury management through real contexts. Table 5 presents respondents' competition participation over the past year.

Table 5. Competition Participation in the Past Year

<b>Number of Competitions (per year)</b>	<b>Frequency</b>	<b>Percentage</b>
1 time	7	35.0%
2 times	6	30.0%
3 times	5	25.0%
4 times	1	5.0%
5 times	1	5.0%
Total	20	100.0%

Overall, 65% of respondents had participated in more than one competition during the past year, suggesting a relatively active competitive involvement. At the same time, the distribution shows variability, indicating that while many athletes have accumulated competition experience, there remains room for increasing exposure and structured learning opportunities.

In general, the descriptive results indicate that most respondents demonstrated

adequate knowledge, although a smaller proportion still showed gaps that require educational reinforcement. The next section presents the detailed knowledge levels across each component and evaluates the need for strengthening first aid education based on the findings.

### PPCO Knowledge

This study assessed athletes' fundamental knowledge of first aid for sports injuries, as this foundation influences how athletes respond during injury events. Respondents were categorized based on score ranges to evaluate their understanding of basic injury management principles.

Table 6. PPCO Knowledge Score Categorization

Category	Value Range	Number of Participants	Percentage
Very High	$\geq 4.384$	0	0%
High	3.894 – 4.384	14	70%
Moderate	3.155 – 3.894	6	30%
Low	2.665 – 3.155	0	0%
Very Low	$< 2.665$	0	0%

The results show encouraging outcomes. As presented in Table 5, 70% of athletes were categorized as having High knowledge, indicating a solid understanding of basic first aid principles. The remaining 30% were classified as Moderate, and no respondents fell into the Very High, Low, or Very Low categories. This suggests that a baseline level of knowledge is present; however, improvement is still needed to shift more athletes toward the highest mastery level.

For comparison, Qasim et al. (2024) reported that among physical education students at the University of Punjab (Pakistan), only 8% were categorized as High, while 52% were Moderate and 40% were Low. In relative terms, the East Java cricket athletes in this study demonstrate stronger first aid knowledge than comparable populations elsewhere.

### PRICE Method

Following the assessment of general first aid knowledge, the analysis was extended to respondents' understanding of the PRICE method.

Table 7. PRICE Knowledge Score Categorization (Protect, Rest, Ice, Compression,

## Elevation)

Category	Value Range	Number of Participants	Percentage
Very High	$\geq 6.42$	0	0%
High	6.01 – 6.41	0	0%
Moderate	5.39 – 6.00	16	80%
Low	4.98 – 5.38	4	20%
Very Low	$< 4.98$	0	0%

Most respondents (80%) showed a Moderate understanding of PRICE, while 20% were categorized as Low. No respondents reached the High or Very High categories. These findings indicate that although athletes recognize the components of PRICE, many have not yet mastered the correct application in practical situations. This aligns with Brukner and Khan (2022), who emphasized that theoretical recognition alone is insufficient without skill-based implementation. Therefore, structured training is needed to strengthen both understanding and execution of PRICE in cricket contexts.

**POLICE Method**

This study also examined respondents' knowledge of the POLICE method, which is an updated approach derived from PRICE. While both approaches emphasize Protection, POLICE introduces Optimal Loading, which is the key difference from PRICE. Because many concepts overlap with PRICE, fewer items were included in the instrument to avoid redundancy, with a central focus on respondents' understanding of Optimal Loading.

Table 8. POLICE Knowledge Score Categorization (Protect, Optimal Loading, Ice, Compression, Elevation)

Category	Value Range	Number of Participants	Percentage
Very High	$\geq 2.57$	0	0%
High	2.12 – 2.56	0	0%
Moderate	1.68 – 2.11	18	90%
Low	1.23 – 1.67	2	10%
Very Low	$< 1.23$	0	0%

Most respondents (90%) demonstrated Moderate knowledge of POLICE, while 10% were categorized as Low. None were classified as High or Very High. This pattern suggests that athletes are generally aware of POLICE as a concept, but their understanding of Optimal Loading remains limited. Considering that Optimal Loading is the core element of POLICE, targeted education is needed to improve athletes' ability to apply the protocol accurately.

**PEACE & LOVE Method**

In addition to PRICE and POLICE, this study investigated respondents' understanding

of the PEACE & LOVE method. This approach is more contemporary and comprehensive, incorporating psychosocial considerations and longer-term recovery principles. The method consists of two phases: PEACE (Protect, Elevate, Avoid anti-inflammatories, Compress, Educate/Exercise) and LOVE (Load, Optimism, Vascularisation, Exercise). Compared to PRICE and POLICE, PEACE & LOVE can be more complex and may require professional support (e.g., sports physicians, physiotherapists) due to the need for clinical assessment, supervised loading, and structured rehabilitation guidance.

Table 9. PEACE & LOVE Knowledge Score Categorization

Category	Value Range	Number of Participants	Percentage
Very High	$\geq 6.36$	1	5%
High	5.75 – 6.36	9	45%
Moderate	5.15 – 5.75	10	50%
Low	4.54 – 5.15	0	0%
Very Low	$< 4.54$	0	0%

The results indicate that 50% of athletes were in the Moderate category, 45% were High, and only 5% reached Very High. No respondents were categorized as Low or Very Low. While these findings reflect a reasonably strong knowledge level, further training is still necessary to move more athletes into the highest category, particularly given the complexity and clinical nuance of PEACE & LOVE.

### Correlation Analysis

Table 10. Correlation Analysis (East Java Cricket Athletes)

Method Pairing	Correlation Coefficient (r)	Significance (p)
PPCO & PRICE	0.65	0.002
PPCO & POLICE	0.40	0.08
PPCO & PEACE & LOVE	0.70	0.001
PRICE & POLICE	0.35	0.12
PRICE & PEACE & LOVE	0.75	$< 0.001$
POLICE & PEACE & LOVE	0.30	0.15

The correlation results in Table 9 show significant positive relationships between PPCO and PEACE & LOVE ( $r = 0.70$ ;  $p = 0.001$ ) and between PRICE and PEACE & LOVE ( $r = 0.75$ ;  $p < 0.001$ ). This indicates that respondents with stronger mastery of PPCO or PRICE also tend to demonstrate better understanding of PEACE & LOVE. In contrast, the other method pairings did not show statistically significant relationships, suggesting that knowledge of one method does not automatically imply understanding of the others.

### Gender Difference Analysis (PPCO)

This study also tested whether there were differences in first aid knowledge (PPCO)

between male and female East Java cricket athletes.

Table 11. Regression Output: Difference in PPCO Knowledge by Gender

Type	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
(Constant)	9.438	1.045	-	9.029	0.000
Ability (Male Athlete)	-0.175	0.111	-0.348	-1.576	0.132

*Dependent Variable:*  
*Ability of female athletes*

The regression results in Table 10 show a constant of 9.438, indicating that if the male-athlete predictor is set to zero, the estimated mean score for female athletes' PPCO understanding is 9.438. However, the effect of gender was not statistically significant ( $B = -0.175$ ;  $\text{Sig.} = 0.132$ ;  $t = -1.576$ ). Although the negative coefficient suggests a slightly lower tendency for male athletes, the difference is not strong enough to be considered meaningful. In other words, the PPCO knowledge levels of male and female athletes can be interpreted as comparable, suggesting that educational reinforcement should be designed inclusively rather than separated by gender.

One plausible explanation for this balance is the increasingly equal access to information, education, and first aid training in Indonesia. Training and socialization programs related to sports injury first aid have been delivered by government agencies, sports organizations, and medical professionals through both offline and online formats, allowing athletes of different backgrounds and genders to gain similar learning opportunities.

Supporting evidence is provided by Hanief et al. (2024) in a program on sports injury first aid education (PPCO) at Batu Football Academy (BAFA), which significantly improved participant understanding. The mean pretest score increased from 60.8 to 89.6 in the posttest, with a gain of 28.8 points ( $p < 0.05$ ), demonstrating the effectiveness of structured education. In addition, Candra et al. (2021) highlighted the importance of applying the PRICE technique as initial injury treatment through a workshop involving basketball athletes and coaches, which improved participants' understanding and practical ability to apply PRICE both theoretically and in practice.

## Discussion

The findings of this study reveal that the knowledge level of East Java cricket athletes

regarding first aid for sports injuries generally ranges from sufficient to high. The strongest level of understanding was observed in the PPCO method, with 70% of athletes classified in the high category. This demonstrates that the athletes have developed a solid foundation in the basic concepts of sports injury management. Meanwhile, knowledge of the PRICE and POLICE methods remained predominantly at the sufficient level (80% and 90%, respectively), suggesting that these approaches are recognized but not yet optimally mastered. For the PEACE & LOVE method, the distribution was more varied, with 50% in the sufficient category, 45% in the high category, and only 5% demonstrating very high knowledge.

Statistical analysis further revealed significant positive correlations between athletes' understanding of PRICE and PEACE & LOVE, as well as between PPCO and PEACE & LOVE. This implies that an increase in knowledge of one method tends to be associated with a higher understanding of another. These results align with the theoretical framework proposed by Dubois & Esculier (2020), which emphasizes the interconnectedness of injury management approaches, particularly in promoting both immediate treatment and long-term recovery.

Regression analysis indicated that gender did not significantly affect athletes' knowledge of PPCO. The regression coefficient (-0.175,  $p = 0.132$ ) suggests that male athletes tended to score slightly lower, yet the difference was not statistically significant. This finding highlights that male and female athletes possess relatively comparable levels of understanding. One potential explanation for this parity is the increasingly equitable access to injury management education and training in Indonesia, facilitated through workshops, government initiatives, and online platforms.

Supporting evidence can be drawn from related studies. Research by Hanief et al. (2024) demonstrated that first aid education programs significantly improved participants' knowledge, with average scores increasing from 60.8 in the pretest to 89.6 in the posttest. Similarly, Candra et al. (2021) highlighted the effectiveness of workshops on the PRICE method in enhancing both theoretical knowledge and practical application among basketball athletes. These findings reinforce the argument that structured education and training programs are essential in strengthening athletes' understanding of first aid methods.

The integration of multiple approaches, such as PRICE, PPCO, and PEACE & LOVE, into comprehensive training modules has also been supported by previous literature. Bleakley et al. (2012) argued that simultaneous exposure to various injury management frameworks increases the effectiveness of learning and prepares practitioners to handle a wider range of injury scenarios. This perspective aligns with the results of the present study, which emphasize the need for continuous training that goes beyond basic knowledge, focusing instead on more advanced, holistic, and contextually adaptive strategies.

Overall, the findings highlight both strengths and areas for improvement. While East Java cricket athletes have already acquired satisfactory knowledge of fundamental concepts, their mastery of newer and more complex methods such as PEACE & LOVE remains limited. Therefore, it is recommended that future educational interventions incorporate integrated modules, combining theoretical instruction with practical simulations. Such programs are expected to enhance athletes' competence, ensure better readiness in injury management, and support long-term athlete welfare.

## CONCLUSION

Based on the findings, East Java cricket athletes generally demonstrate a sufficient to high level of knowledge regarding first aid for sports injuries, with the strongest understanding found in PPCO (70% in the high category), indicating a solid foundation in basic injury management. However, knowledge of the PRICE and POLICE methods remains mostly at the sufficient level (80% and 90%), suggesting that these protocols are recognized but not yet mastered for optimal application. Understanding of PEACE & LOVE is more varied, with most athletes falling into sufficient and high categories, yet only a small proportion reaching very high knowledge, reflecting limited mastery of this more complex and contemporary approach. Significant positive correlations between PPCO–PEACE & LOVE and PRICE–PEACE & LOVE indicate that stronger foundational knowledge tends to support broader understanding across methods. Gender was not a significant predictor of PPCO knowledge, implying comparable understanding between male and female athletes. Overall, these results underline the need for integrated and continuous first aid education that combines theoretical instruction with practical simulations to strengthen athletes' readiness and ensure safer, more effective injury management.

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