

**Identification of the Location, Type, and Causes of Fencers Injuries Based on Disciplines****Amalia Ulfah^{1✉}, Aryadi Rachman², Mita Erliana³**Physical Education Study Program, Faculty of Teacher Training and Education, Lambung Mangkurat University, Banjarbaru, Indonesia¹²³**Article History**Received March 2024
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Abstract

This study aims to determine the location, type, and cause of fencers South Kalimantan injuries in base on discipline. The method used in this research is descriptive with quantitative research type. The results showed that (1) epee fencers, injuries were often experienced in the inferior part of the thigh 35.71%, with the type of bruise injury 28.57% and the cause was mostly from intrinsic factors due to incorrect movement techniques and lack of warm-up 20% each. (2) sabre fencers, injuries are often experienced in the inferior part of the thigh 44.44%, with the types of bruises, cramps, and abrasions 25.00% each and the most causes of intrinsic factors due to lack of warm-up 29.41%. (3) foil fencers, injuries are often experienced in the inferior part of the thigh 44.44%, with bruises and cramps 30.77% each and the most common cause of intrinsic factors due to lack of warm-up 50%. The conclusion (1) epee fencers the location of injuries that are often experienced is in the inferior with the type of bruising injury caused by intrinsic factors. (2) sabre fencers, the location of injuries that are often experienced is in the inferior with the types of bruises, cramps and abrasions caused by intrinsic factors. (3) foil fencer the location of injuries that are often experienced is in the inferior with the types of bruises and cramps caused by intrinsic factors.

How to Cite

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INTRODUCTION

PON is a national sports event held every four years (Maulana & Khairani, 2017) and this event is also called a multi-event, because it competes in all achievement sports in Indonesia. Broadly speaking, achievement sports are categorized into 4 namely measurable sports, games, accuracy and martial arts. (Santosa, 2022).

Martial arts sports are sports that require direct physical contact in which there are attacking and self-defense techniques. (Nisa & Jannah, 2021). The types of sports categorized as martial arts are pencak silat, karate, taekwondo, kempo, fencing etc.

Fencing is a martial art sport that uses weapons (Syahrial, 2020). This sport is also called a complex sport because when doing it requires special tactics, the techniques used in this sport are defense, tuse, parry, and attack (Rizkiyati & Ismalasari, 2022). Fencing sport has 3 kinds of disciplines (weapons) that have different characteristics, these weapons are epee, sabre, and foil. (Al Mufarid, 2020).

The occurrence of injuries during training and competition is something that is often experienced by athletes in all sports, including fencing. Injuries that are often experienced by fencing athletes are to the upper extremities and lower extremities (Walrod et al., 2019). The discipline used have different injury risks Peter in his article mentions the risk of injury epee had a significantly lower risk than foil of sabre intrinsic effort of the fencer was the most common (Harmer, 2019).

Fencing sports in South Kalimantan have athletes who have the potential to achieve achievements at the National level. The results of direct observation of South Kalimantan fencing athletes during the Pre PON event in Banten, South Kalimantan brought many athletes who had the potential to achieve achievements at the event, but there were inhibiting factors in the form of many athletes experiencing injuries both during training and during matches so that athletes could not perform their best performance to achieve achievements in the PON SUMUT Qualification Round in Banten September 1-6, 2023.

The relevant research in this study is research by Peter A Harmer in an article entitled "Epidemiologi Of Time-Loss Injuries In International Fencing : A Prospective, 5-Year Analysis Of Federation Internationale d'Esctime Competitions". The purpose of Peter A Harmer's study was to determine the risk of adverse time in international fencing and to characterize the type, location, severity, and mechanism. The results of this study stated that the risk of injury experien-

ced by degen weapon fencing athletes was lower than fencing athletes with floret and sabel weapons and of all injuries experienced by fencing athletes, the location of injuries often occurred in the lower extremities 72.4%, with the type of injury stretching or tearing of ligaments reaching 40.8%, and intrinsic causes were the common cause of all injuries that occurred. (Harmer, 2019).

Data from athletes outside Indonesia does not necessarily describe the situation in Indonesia, especially South Kalimantan. On the other hand, research data on injuries to fencing athletes in Indonesia is very minimal and research on sports injuries experienced by fencing athletes in terms of weapon use in Indonesia, especially South Kalimantan, has never been done. Therefore, research related to the location, type, and cause of injury of South Kalimantan fencing athletes who participated in Pre PON in Banten in terms of weapon use needs to be done.

The expected purpose of this study is to identify the location, type, and cause of sports injuries of South Kalimantan fencing athletes that occur during training and matches at the Pre PON event in terms of weapon use. With the implementation of this research, it is hoped that it can trigger further research to find and provide solutions to minimize the occurrence of injuries and prepare appropriate treatment for sports injuries experienced by fencing athletes based on the type of weapon used during training and matches.

METHODS

This research is descriptive research (Muliawan & Jasa, 2014; Noor et al., 2021) with quantitative research type (Sugiyono, 2017), which describes the percentage of locations, types and causes of sports injuries that occur during training and matches based on the type of weapon used. The population in this study were South Kalimantan fencing athletes, using purposive sampling technique (Danuri & Maisaroh, 2019; Ginting et al., 2022), the sample in this study were South Kalimantan fencing athletes who participated in the Pre PON event in Banten totaling 20 people (7 epee fencers, 7 sabre fencers, 6 foil fencers).

Identification carried out in this study using a closed questionnaire (Arikunto & Suharsimi, 2023) given to south Kalimantan fencers who participated in the Pre PON event ia google form, with alternative answers in the form of factors from location, type, dan causes of sport injury. The following factors from the location,

type, and cause of sports injuries are alternative answers to the questionnaire : 1) the location of the injury, upper body/superior (head; face, neck, chest, abdomen, back, shoulder, elbow, arm, wrist, fingers) and lower body/inferior (waist, hip or pelvis, buttocks, shins, feet, thighs, knees, ankles, toes, insteps, soles of the feet) (Siddiq, 2023) 2) types of injuries (bruises, cramps, fractures, dislocations, seizures, fainting, stains, sprain, testicular injuries, bleeding, blisters, abrasions) 3) The causes of injury are divided into two, namely from intrinsic factors (age, personal factors, experience, skills or abilities, overtrain, wrong movement techniques, lack of warm-up, lack of rest, lack of nutrition, posture abnormalities) and extrinsic (Collisions occur, Facilities (Equipment used in training or matches), Infrastructure (Place / Field), Environment, Fanatic supporters, Referees who officiate unfairly, Sports character) (Ridha & Rachman, 2023) .

Then the results of the sports injury data obtained were percented based on the type of weapon used by the athlete. According to (Rujakat, 2018) The percentage formula used is as follows:

$$P = f/n \times 100\%$$

P : Percentage

f : Frequency sought

n : Total frequency

RESULTS AND DISCUSSION

The results and discussion of the description of the sub-variables and indicators of the variables location, types and causes of sports injuries used as answers to the questionnaire, and the answers to the questionnaire are the data in this study.

The results of descriptive analysis of each data are presented based disciplin, the three types of discipline are: (1) epee, (2) sabre, (3) foil. The results of the data analysis are presented as follows:

On Epee Fencers

Location of injury

The total location of injury experienced epee fencers is 26 locations. 46.15% were at Superior locations and 53.85% were at Inferior locations. The following is a breakdown of the Location of injury experienced epee fencers that occurs in the superior / upper body and inferior / lower body which is presented in **Table 1** and **Table 2**.

Table 1. Superior

Location	Amount	Percentage
Head	0	0,00%
Face	0	0,00%
Neck	0	0,00%
Chest	1	8,33%
Abdomen	0	0,00%
Back	0	0,00%
Sholder	1	8,33%
Elbow	0	0,00%
Arm	4	33,33%
Wrist	3	25,00%
Fingers	3	25,00%
Total	12	100%

Table 2. Inferior

Location	Amount	Percentage
Waist		0,00%
Hip Or Pelvis	2	14,29%
Buttocks		0,00%
Genital		0,00%
Thigh	5	35,71%
Lutut	3	21,43%
Angkle	1	7,140%
Back of the food	0	0,00%
The sole of the foot	1	7,14%
Toes	2	14,29%
Total	14	100%

Table 1. Show the location of injury experienced epee fencers in superior locations as many as 12 locations. Injuries to the arms reached 33.33% or 4 answers, wrists and fingers each 25% or 3 answers, then chest and shoulders each 8.33% or 1 answer.

Table 2. Show the location of injury experienced epee fencers in inferior locations as many as 14 locations. Injuries to the thigh reached 35.71% or 5 answers, knees 21.43% or 3 answers, hips pelvis and toes 14.29% or 2 answers each.

Types of injury

Total Types of injuries experienced epee fencers are 21 types. The following is a breakdown of the Types of injury experienced epee fencers presented in **Table 3**.

Table 3. Show the Types of injury experienced epee fencers are 21 types. bruises reached 28.57% or 6 answers, blisters 23.81% or 5 answers, cramps and blisters 14.29% or 3 answers each, sprain 9.52% or 2 answers, stain 4.76% or 1 answer.

Table 3. Types of injury

Type	Amount	Percentage
Bruises	6	28,57%
Cramps	3	14,29%
Fracture	0	00,0%
DisLocation	0	0,00%
Seizure	0	0,00%
Fainting	0	0,00%
Strain	1	4,76%
Sprain	2	9,52%
Injury to the testicle	0	0,00%
Bleeding	1	4,76%
Blisters	3	14,29%
Scuffed	5	23,81%
Total	21	100%

Causes of injury

Total Causes of injury yang dialami epee fencers sebanyak 28 penyebab. 71,43% dari Intrinsic factors dan 28,57% dari Extrinsic factors. The following details the Causes of injury experienced by epee fencers that occur from intrinsic factors and extrinsic factors are presented in **Table 4** and **Table 5**.

Table 4. Intrinsic factors

Factor	Amount	Percentage
Age	0	0,00%
Personal factors	3	15,00%
Experience	2	10,00%
Skills	2	10,00%
Overtrain	1	5,00%
Incorrect movement technique	4	20,00%
Lack of warm-up	4	20,00%
Lack of rest	3	15,00%
Lack of nutrition	1	5,00%
Posture abnormalities	0	0,00%
Total	12	100%

Table 5. Extrinsic factors

Factor	Amount	Percentage
collision	3	37,50%
Facilities	2	25,00%
Infrastructure	1	12,50%
Environment	0	0,00%
Fanatical supporters	0	0,00%
Referee is not fair	0	0,00%
Sports character	2	25,00%
Total	8	100%

Table 4. Show the causes of injury experienced by epee fencers from intrinsic factors as many as 20 factors. Wrong movement techniques and lack of warming each 20% or 4 answers, personal factors and lack of rest 15% or 3 answers, experience and skills 10% or 2 answers, overtrain 5% or 1 answer.

Table 5. Show the causes of injury experienced by epee fencers from Extrinsic factors as many as 8 factors. Collisions reached 37.50% or 3 answers, sports facilities and factors 25% or 2 answers, infrastructure 12.50% or 1 answer.

On Sabre Fencers**Location of injury**

The total location of injury experienced by sabre fencers is 13 locations. 69.23% were at the Inferior location and 30.77% were at the Superior location. The following details of the Location of injury experienced by sabre fencers that occur in the superior / upper body and inferior / lower body are presented in **Table 6** and **Table 7**.

Table 6. Superior

Location	Amount	Percentage
Head	0	0,00%
Face	0	0,00%
Neck	0	0,00%
Chest	0	0,00%
Abdomen	1	25,00%
Back	0	0,00%
Sholder	2	50,00%
Elbow	0	0,00%
Arm	0	0,00%
Wrist	0	0,00%
Fingers	1	25,00%
Total	4	100%

Table 7. Inferior

Location	Amount	Percentage
Waist	0	0,00%
Hip Or Pelvis	0	0,00%
Buttocks	0	0,00%
Genital	4	44,44%
Thigh	1	11,11%
Lutut	1	11,11%
Angkle	1	11,11%
Back of the food	1	11,11%
The sole of the foot	1	11,11%
Total	9	100%

Table 6. shows the location of injury experienced by sabre fencers in the superior location of 4 locations. Injuries to the shoulder accounted for 50% or 2 answers, abdomen and fingers 25% or 1 answer each.

Table 7. Shows the location of injury experienced by sabre fencers in the inferior location as many as 9 locations. Injuries to the thigh accounted for 44.44% or 4 answers, then the knee, ankle, instep, sole and toes each 11.11% or 1 answer.

Types of injury

The total types of injuries experienced by sabre fencers are 12 types. The following details the Types of injuries experienced by sabre fencers are presented in Table 8 below:

Table 8. Types of injury

Type	Amount	Percentage
Bruises	3	25,00%
Cramps	3	25,00%
Fracture	0	00,0%
DisLocation	0	0,00%
Seizure	0	0,00%
Fainting	1	8,33%
Strain	0	0,00%
Sprain	2	16,67%
Injury to the testicle	0	0,00%
Bleeding	0	0,00%
Blisters	0	0,00%
Scuffed	3	25,00%
Total	12	100%

Table 8. Shows the types of injuries experienced by sabre fencers as many as 12 types. Bruises, cramps, and abrasions were 25% or 3 answers each, sprain was 16.67% or 2 answers, fainting was 8.33% or 1 answer.

Causes of injur

The total causes of injury experienced by sabre fencers were 17 causes. 80.95% from Intrinsic factors and 19.05% from Extrinsic factors. The following details of Causes of injury experienced by sabre fencers that occur from Intrinsic factors and Extrinsic factors are presented in **Table 9** and **Table 10**.

Table 9. shows Causes of injury experienced by sabre fencers from Intrinsic factors as many as 17 factors. lack of heating 29.41% or 5 answers, wrong movement techniques 23.53% or 4 answers, lack of rest 17.65%, personal factors and lack of nutrition 11.76%, overtrain 5.88% or 1 answer.

Table 9. Intrinsic factors

Factor	Amount	Percentage
Age	0	0,00%
Personal factors	2	11,76%
Experience	0	0,00%
Skills	0	0,00%
Overtrain	1	5,88%
Incorrect movement technique	4	23,53%
Lack of warm-up	5	29,41%
Lack of rest	3	17,65%
Lack of nutrition	2	11,76%
Posture abnormalities	0	0,00%
Total	17	100%

Table 10. Extrinsic factors

Factor	Amount	Percentage
collision	1	25,00%
Facilities	0	0,00%
Infrastructure	1	25,00%
Environment	1	25,00 %
Fanatical supporters	0	0,00%
Referee is not fair	1	25,00%
Sports character	0	0,00%
Total	4	100%

Table 10. Show the Causes of injury experienced by sabre fencers from Extrinsic factors as many as 4 factors. Collision, infrastructure, environment and referee are not each 25% or 1 answer.

On Foil Fencers

Location of injury

The total location of injury experienced by foil fencers was 16 locations. 56.25% were in the Inferior location and 43.75% were in the Superior location.

The following details of the Location of injury experienced by foil fencers that occurred in the superior / upper body and inferior / lower body are presented in **Table 11** and **Table 12**.

Table 11. shows the location of injury experienced by foil fencers in the superior location of 7 locations. Injuries to the wrist reached 42.85%, fingers 28.57% or 2 answers, shoulder and arm 14, 29% or 1 answer.

Table 12. Shows the location of injury experienced by foil fencers in the inferior location as many as 9 locations. Injuries to the thigh reached 44.44% or 4 answers, knee 22.22% or 2 answers, waist, hip and pelvis each 11.11% or 1 answer.

Table 11. Superior

Location	Amount	Percentage
Head	0	
Face	0	0,00%
Neck	0	0,00%
Chest	0	0,00%
Abdomen	0	0,00%
Back	0	0,00%
Sholder	1	14,29%
Elbow	0	0,00%
Arm	1	14,29%
Wrist	3	42,85%
Fingers	2	28,57%
Total	7	100%

Table 12. Inferior

Location	Amount	Percentage
Waist	1	11,11%
Hip Or Pelvis	1	11,11%
Buttocks	0	0,00%
Genital	0	0,00%
Thigh	4	44,44%
Lutut	2	22,22%
Angkle	0	0,00%
Back of the food	0	0,00%
The sole of the foot	0	0,00%
Toes	1	11,11%
Total	9	100%

Types of injury

Total Types of injury experienced by foil fencers are 13 types. The following details of Types of injury experienced by foil fencers are presented in **Table 13**.

Table 13. Types of injury

Type	Amount	Percentage
Bruises	4	30,77%
Cramps	4	30,77%
Fracture	0	00,0%
DisLocation	0	0,00%
Seizure	0	0,00%
Fainting	0	0,00%
Strain	1	7,69%
Sprain	1	7,69%
Injury to the testicle	0	0,00%
Bleeding	0	0,00%
Blisters	0	0,00%
Scuffed	3	23,08%
Total	13	100%

Table 13. Shows the types of injuries experienced by foil fencers as many as 13 types. Cramps and bruises were 30.77% or 4 answers each, abrasions were 23.08% or 3 answers, and stains and sprain were 7.69% or 1 answer each.

Causes of injury

The total causes of injury experienced by foil fencers were 14 causes. 71.43% from Intrinsic factors and 28.57% from Extrinsic factors. The following details of Causes of injury experienced by foil fencers that occur from Intrinsic factors and Extrinsic factors are presented in **Table 14** and **Table 15**.

Table 14. Intrinsic factors

Factor	Amount	Percentage
Age	0	0,00%
Personal factors	1	10,00%
Experience	0	0,00%
Skills	0	0,00%
Overtrain	2	20,00%
Incorrect movement technique	2	20,00%
Lack of warm-up	3	30,00%
Lack of rest	1	10,00%
Lack of nutrition	0	0,00%
Posture abnormalities	1	10,00%
Total	10	100%

Table 15. Extrinsic factors

Factor	Amount	Percentage
collision	2	50,00%
Facilities	2	50,00%
Infrastructure	0	0,00%
Environment	0	0,00%
Fanatical supporters	0	0,00%
Referee is not fair	0	0,00%
Sports character	0	0,00%
Total	4	100%

Table 14. Show causes of injury experienced by foil fencers from Intrinsic factors as many as 10 factors. Lack of warming up reached 30% or 3 answers, overtrain and wrong movement techniques 20% or 2 answers Personal factors, lack of rest, and posture abnormalities 10% or 1 answer.

Table 15. Shows the causes of injury experienced by foil fencers from Extrinsic factors as many as 4 factors. Collisions and facilities each 50% or 2 answers.

On Epee Fencers

The results of the research Location of injury that is often experienced by South Kalimantan epee fencers during the Pre PON event with 7 athletes is the thigh. This is in line with the results of research conducted by Peter et al (2019), stating that fencing athletes can experience injuries to the thigh and are the third highest percentage injury after injuries to the knee and ankle. (Harmer, 2019). This is reinforced by Alekseyev (2016) in his research results stating that the hamstrings are one of the locations of injury that can be experienced by fencing athletes. (Alekseyev et al., 2016).

The results of the research Types of injury that are often experienced by epee fencers are bruises. Bruises are Types of injury caused by the impact of hard objects on the soft tissues of the body (Aryadana & Supriyono, 2022). This is confirmed by research conducted by Peter et al (2019) which states that fencing athletes can experience bruising injuries. (Harmer, 2019).

The results of the research Causes of injury that are often experienced by epee fencers are from Intrinsic factors, namely wrong movement techniques and lack of warm-up. Lack of warm-up causes blood circulation and muscle flexibility is not optimal, cramps experienced by degen weapon fencing athletes can occur due to repetition of step / foodwork and attack techniques but athletes do not warm up enough beforehand. Basically, muscles need energy to perform movements, if blood circulation in the muscles is not optimal it will cause a buildup of lactic acid and result in cramps. (Baskoro et al., 2018). The results of this study are in line with research conducted by Peter et al (2019), stating that the most common cause of injury is from Intrinsic factors. (Harmer, 2019). This is also confirmed by research conducted by Usra (2013) the most common cause committed by novice martial arts athletes is the ineffectiveness of warming up / stretching before doing sports. (Usra, 2012)

On Sabre Fencers

The results of research on the location of injuries that are often experienced in South Kalimantan sabre fencers during the Pre PON event with a total of 7 athletes are on the thigh. This is in line with the results of research conducted by Peter et al (2019), stating that fencing athletes can experience injuries to the thigh and is the third highest percentage injury after injuries to the knee and ankle. (Harmer, 2019). This is reinforced by Alekseyev (2016) in his research results stating that the hamstrings are one of the loca-

tions of injury that can be experienced by fencing athletes. (Alekseyev et al., 2016).

Research results Types of injuries that are often experienced by sabre fencers are cramps, bruises, and abrasions. Muscle cramps are contractions experienced by a group of muscles continuously causing pain. (Baskoro et al., 2018). A bruise is an injury caused by the impact of a hard object on the soft tissues of the body. (Aryadana & Supriyono, 2022). A blister is a type of open wound that appears on the uppermost layer of skin (epidermis) caused by the skin rubbing against a rough surface. (Purwanto, 2022). This is confirmed by research conducted by Peter et al (2019) which states that fencing athletes can experience injuries in the form of muscle tension / cramps, bruises and others. (Harmer, 2019).

The results of the research Causes of injury that are often experienced by sabre fencers are from Intrinsic factors, namely lack of warm-up. Lack of warm-up results in lack of blood circulation and muscle flexibility. Cramps experienced by sabel weapon fencing athletes can occur due to foodwork, attacks and or steps to get the priority of attacks, but athletes do not warm up beforehand. Basically, muscles need energy to make movements, if blood circulation in the muscles is not optimal it will cause a buildup of lactic acid and result in cramps. (Baskoro et al., 2018). The results of this study are in line with research conducted by Peter et al (2019), stating that the most common cause of injury is from Intrinsic factors. (Harmer, 2019). This is also confirmed by research conducted by Usra (2013) the most common cause committed by novice martial arts athletes is the ineffectiveness of warming up / stretching before doing sports. (Usra, 2012).

On Foil Fencers

The results of the research Location of injury that is often experienced in South Kalimantan ffoil fencers during the Pre PON event with a total of 6 athletes is on the thigh. This is in line with the results of research conducted by Peter et al (2019), stating that fencing athletes can experience injuries to the thigh and are the third highest percentage injury after injuries to the knee and ankle. (Harmer, 2019). This is reinforced by Alekseyev (2016) in his research results stating that the hamstrings are one of the locations of injury that can be experienced by fencing athletes. (Alekseyev et al., 2016).

Research results Types of injuries that are often experienced by floret fencing athletes are cramps and bruises. Muscle cramps are contractions experienced by a group of muscles continu-

ously causing pain. (Baskoro et al., 2018). Memar adalah cedera yang disebabkan oleh benturan benda keras pada jaringan lunak tubuh (Aryadana & Supriyono, 2022). This is confirmed by research conducted by Peter et al (2019) which states that fencing athletes can experience injuries in the form of muscle tension / cramps and bruises. (Harmer, 2019).

The results of the research Causes of injury that are often experienced by floret fencing athletes are from Intrinsic factors, namely the lack of warm-up. Lack of warm-up results in lack of blood circulation and muscle flexibility, basically muscles need energy to perform movements, if blood circulation in the muscles is not maximized it will cause a buildup of lactic acid and result in cramps. (Baskoro et al., 2018). The results of this study are in line with research conducted by Peter et al (2019), stating that the most common cause of injury is from Intrinsic factors. (Harmer, 2019). This is also confirmed by research conducted by Usra (2013) the most common cause committed by novice martial arts athletes is the ineffectiveness of warming up / stretching before doing sports. (Usra, 2012).

The results of the research Location and Causes of injury that are often experienced by South Kalimantan fencing athletes are in line with the research, where the location of the body that has many injuries is in the lower / inferior body and the Causes of injury are generally from Intrinsic factors. The results of the research Types of injury that are often experienced by South Kalimantan fencing athletes do not have alignment with relevant research. This can occur because the risk of sports injuries does not occur due to the character of the sport alone, but can occur due to lack of warm-up, muscle unpreparedness, facilities and infrastructure problems, and collisions that occur. (Yuliawan & Setiawan, 2019).

CONCLUSION

In epee fencers, the Location of injury that is often experienced is at the inferior location / lower body on the thigh with Types of injury bruises caused by Intrinsic factors, namely wrong movement techniques and lack of warm-up.

In sabre fencers, the location of injury that is often experienced is at the inferior/body location on the thigh with Types of injury bruises, cramps and blisters caused by Intrinsic factors, namely lack of warm-up. In foil fencers, the Location of injury that is often experienced is at the inferior location on the thigh with Types of injury bruises and cramps caused by Intrinsic factors, namely lack of warm-up.

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