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The Analysis of Karate Sport Injury in IKIP PGRI Pontianak

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***Abstract*—Based on observations in karate sport, the researcher found various forms of injuries experienced by athletes in karate. The purpose of this study was to determine the types of injuries that occur in karate athletes. The research used a qualitative descriptive method. A survey, using questionnaires and interviews for collecting data, was conducted. The subjects and objects of this study were 40 students who participated in the student activity unit in the karate sport. Place for conducting the research was IKIP PGRI Pontianak. The results showed that there were 85 cases of athletic injuries. It means that every athlete might experience multiple injuries in karate sport, including 16 athletes had cramps, 14 athletes had bruises, 10 athletes had swelling, 6 athletes had spasm, 5 athletes had strains, 7 athletes experienced sprain, 12 athletes experienced muscle gliding, 5 athletes experienced joint dislocation, 4 athletes experienced fracture, and 6 athletes experienced subluxation.**

Keywords: analysis, injury, karate sports

I. INTRODUCTION

Martial sports are a very popular sport because this sport describes a group of competitive sports from two athletes who fight each other [1]. Martial sports vary greatly in their techniques, rules, and protective equipment and these factors affect injury and injury rates. One of the martial arts that has the risk of injury is karate [2]. Karate is a self-defence sport that demands skills and techniques and high self-confidence [3], so as to be able to perform good and consistent games in a match. The risk of sports injuries is very possible for every athlete doing exercise or competing [4].

The karate sports branch is a sport that prioritizes practical and tactical movement techniques [5], but that does not mean that it is only silent but fast, strong and accurate movements or can be said to be more concerned with dynamic, antagonistic muscle work. The muscles involved when performing movement techniques are as follows:

TABLE I. TECHNIQUE AND MUSCLE USE

No	Technique	Muscle
1	Foot technique: • geri/kick • harai/sweeping • dachi/stance	• Abdominal. • Hip flexor. • gluteus maximus/minimus. • psoas group. • Hamstring. • Quadriceps. • Lateralis &medialis. • Tibialis/febularis. • Gastrocnemeus/calf. • Ankle. • Foot's finger (koshi). • In/out side foot (sokuto). • Back foot
2	Hand technique: • tsuki/punch • uchi/snap punch • uke/block	• Flexor/extensor digitorun. • Wristcle. • Bicep. • Tricep. • Deltoid. • Sternocleidomastoideus. • Teres mayor/minor. • Sacrospinale. • Trapezius. • Pectoralis mayor/minor. • Latissimus dorsi. • Abdominal. • Gluteus maximus/minimus

Injury is a physical damage that results when the human body suddenly receives an amount of energy that cannot be tolerated [6]. Sports injuries can be classified according to the causes of injury and the type of damage to body tissues. Classification according to causes is divided into direct injuries, indirect injuries, and overuse injuries. Meanwhile, classification according to the type of damage to body tissue is divided into soft tissue injury and hard tissue injury [7].

Risk factor identification is an important step in the prevention of sports injuries [8]. The etymology of sports injuries is influenced by many factors including internal factors and external factors [9]. Internal factors refer to factors originating in athletes such as age, gender, and biomechanics. Meanwhile, external factors refer to factors affecting athletes from outside, such as the environment, sports equipment, sports regulations. Some of these factors can be modified such as operating expenses and sports equipment [10], but some of them are also not modifiable such as age, sex. Internal factors include age, gender, body composition, health, physical fitness and psychological aspects that affect athletes against injury. The presence of external factors including sports factors, protective equipment, sports equipment and the environment that can cause athletes to be more susceptible to injury, and ultimately for the occurrence of an injury, it is necessary to trigger events such as game situations, player or opponent

behaviour, biomechanical errors, and more detailed biomechanical description. The purpose of this study are: (1) To know injury often occurs in karate UKM in IKIP PGRI Pontianak, (2) To find out the causes of karate UKM injuries in IKIP PGRI Pontianak.

II. Research Methodology

The method used in this research is quantitative descriptive. Tmethod used is a survey with data collection using questionnaires and interviews. This research was carried out on campus IKIP PGRI Pontianak at the sports student activity unit in the karate sport. The subjects in this study were 40 students who were members of the karate sports student activity unit. With characteristics age 18-23 years. This research was conducted twice in October 2016 and November 2017.

III. Results and Discussion

The results of this study indicate several injuries that occur in karate athletes based on the results of questionnaires and interviews incorporated in the student activity unit consisting of 40 students and has 85 cases of cramps, bruises, swelling, spasm, sprain, strains, muscle gliding, dislocation, fractures and subluxation. This is obtained based on questionnaires and interviews with karate athletes in the karate sports activity unit with age characteristics below:

TABLE II. Subject Characteristics by Age

Age	Frequency	Percentage
18	4	10%
19	4	10%
20	10	25%
21	11	27,5%
22	9	22,5%
23	2	5%
Total	40	100%

Amounts based on the table above, it is known that athletes have a very diverse age between 18 and 19 years, there are 10%, 20 years as big as 25%, 21 years old at 27.5%, 22 years old at 22.5% and 23 years old at 5 %.

TABLE III. Percentage of Location of Injuries that Occur in Karate Athletes

Location of injury	Frequency	Percentage
Trunk	12	14,1%
Upper extremity	38	44,7%
Lower extremity	35	41,2%

Based on the table above, it is known that the location of injuries that are often experienced by karate athletes is in the upper extremities by 44, 7%, and the lower extremities by 41.2% while in the trunk area by 14.1%.

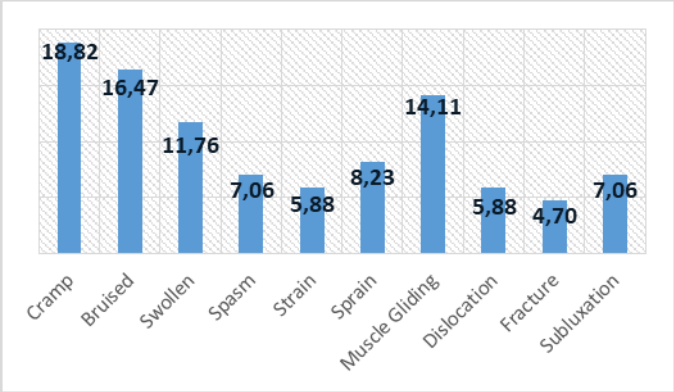

Fig. 1. Injury to karate athletes.

Based on data above, injuries that occur in karate athletes show cramping injury of 18.82%, which experienced bruising of 16.47%, which experienced swelling by 11.76%, which experienced spasm of 7.06%, which experienced a strain of 5.88%, who experienced a sprain of 8.23% who underwent muscle gliding at 14.11% who experienced a dislocation of 5.88% who experienced a fracture of 4.70%, and who experienced subluxation of 7.06%.

Karate is an empty-handed self-defence in which systematically trained hands and feet from enemy attacks with reflexes can be controlled by demonstrating the power of using real weapons. Karate is a sport that controls all body movements [11], such as bending, jumping and balancing, by learning to move members and bodies front and back, left and right up and down, freely and regularly.

Based on the above, for athletes are required to have a group of muscles that are stronger than the other parts of the muscle. The body's response to this demand is through a group of certain muscles to contract harder [12]. Activities that are carried out excessively or not physiologically, will cause adverse effects, such as exercise, if done properly and regularly according to the appropriate function will make the body adapt to its activities, but if done continuously without regard to the physiological adaptation of the body it can cause injury. All kinds of injuries that arise, both during training and at the time of the match or after the match, are commonly affected by bones, muscles, tendons, and ligaments.

Injury is a physical damage that results when the human body suddenly receives an amount of energy that cannot be tolerated [13]. This can be damage to the tissue due to exposure to a certain amount of energy that exceeds the tolerance threshold of the human body tissue, while sports injury is an injury that is obtained during sports activities both during training and during competition [14]. Injury is a lesion of micro traumatic lesions caused by repetitive mechanical motion which results in a cumulative effect [15]. Injury is the result of an excessive force delegated to the body and the body cannot withstand or adjust to the burden. Injury is a damage to the structure or function of the body due to coercion and physical or chemical pressure. Injury is an unpleasant feeling and when it occurs during exercise is called sports injury [16].

Sports injuries are all kinds of injuries that arise, both during training and during exercise or afterwards [17]. Sports

injuries are defined as injuries that occur as a result of sports activities both directly and indirectly, which affect the musculoskeletal system and all other systems and organs that influence it, affecting other systems [18]. Sports injuries can be caused by two important factors, namely internal and external factors [19]. Internal factors are factors whose elements already exist in the athlete. This includes network weaknesses, lack of flexibility or overload, biomechanical errors, and work ability and play style. Sports injuries if not handled quickly and correctly can result in disruption and physical limitations, both in daily life and in sports activities that are occupied.

Handling injuries is an important part of treatment so athletes can continue their achievements [20]. The faster the injury is, the better. All this time what the coach has done is using the PRICED (Protection, Rest, Ice, Compression, Elevation, Diagnosis) method with the aim of relieving pain, reducing swelling and speeding healing and can only be done within 48 hours. But in this case the PRICED method is insufficient in managing injuries that continue so that the injured tissue will gradually improve and can return to normal. This can help coaches and athletes in preparing athletes to continue training programs that have been created and designed by the coach. This cannot work well if the athlete is still injured or the improvement is not optimal.

The basic components that should be considered for the purpose of the injury management program for martial arts athletes should include (1) providing first-aid directly and injury management to control swelling; (2) reduce or minimize pain, (3) build core stability; (4) rebuild neuromuscular control; (5) improve postural stability and balance; (6) restoring various motions; (7) restore or increase muscle strength, endurance, and explosive power; (8) maintaining cardiorespiratory fitness; and (9) combine appropriate functional progressions.

IV. Conclusion

Based on the analysis of sports injuries that occur in karate athletes in the student activity unit environment IKIP PGRI Pontianak is 18.82% of athletes have experienced cramping injuries. Cramps are injuries that occur to athletes both when practicing, competing and afterwards. Not only do cramping injuries that occur in karate athletes have spasm, spraint, strain, muscle gliding, dislocation, fracture and subluxation injuries and athletes experience multiple injuries. Injuries that occur due to internal and external factors.

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