

Study on the Actual Condition and Prevention of Safety Accidents in Special Martial Arts

Byeon Kyung Won

Crisisonomy Cooperation Course at Chungbuk National University, Chungcheongbuk-do, Chung-daero 1, Seowon-gu, Cheongju-si, Chungcheongbuk-do

ABSTRACT

The purpose of this study is to minimize the occurrence of injuries and protect trainees from them to conduct safer training activities by studying the causes and events of injuries, areas, and training methods in special martial arts. To achieve this research purpose, a total of 292 people's data were used using the cluster random sampling method after setting special martial arts trainees currently located in A area of Gyeonggi-do as a population. Referring to the questionnaire on motor injury used, the characteristics of the subjects of this study and the research tools were modified and supplemented according to the purpose in studies such as Kang Jae-young (1998), Jeon Tae-hoon (2000), and Cho Myung-hwan (2002). Descriptive statistical analysis was conducted using SPSSPC+ Ver15.0 for WINDOWS for data processing.

Key words: Exercise injury; martial arts

1. Introduction

1.1. Background of the study

Recently, rapid development of material civilization and advanced industrial development have provided convenient lifestyles for humans and increased the need for leisure, but due to less physical activity, the importance of exercise has increased day by day. Therefore, everyone tries to maintain good health and exercises in one way. Moderate exercise can improve healthy physical strength and improve mental and physical functions, but it can cause various injuries to the human body if it is wrong. A healthy body grows and develops into a stronger and more competent individual by applying systematic and intentional physical activity and an appropriate level of stimulation. Dance training in adolescence is an area of education that changes and grows incomplete individuals in a desirable direction, and can be an important tool for a more developed and competitive future when teenagers train their mind and body in a good environment and conditions. However, the phenomenon of neglecting training activities due to the heavy burden of study and the spread of educationalist social climate caused physical activity opportunities to decrease, causing problems such as physical decline and imbalance (Yoon Oh-nam, 2002). Therefore, this study aims to improve self-health ability by

changing the right knowledge, attitude, and behavior in a desirable direction through special martial arts training, and analyze why accidents occur, and apply the results to special martial arts training to help officials conduct safer and more efficient training.

1.2. Purpose of the study

The purpose of this study is to minimize the occurrence of injuries and protect trainees from them to conduct safer training activities by classifying the timing and types of injuries and investigating the causes and events of injuries.

1.3. Limitations of the study

This study has the following limitations to analyze the injury factors and prevention of special martial arts trainees.

First, since the items subject to this study are limited to special martial arts events, there is a limit to generalizing them to injuries of all martial arts events. Second, the causes of injuries other than those that occur during special martial arts training were not considered.

Third, psychological factors and personal conditions were not considered when training special martial arts.

2. Materials and Methods

2.1. Types of sports injuries

Human beings needed physical movement from birth, and various forms of physical activity naturally developed into various sports as sports were systematized and organized over time, and the occurrence of sports-related injuries with sports was inevitable (Lim Ho-geun, 1999). Injury can be said to be an overall trauma and disorder that occurs in everyday life. As for physical injuries, a lot of injuries occur in specific areas according to each event, and the areas that occur vary depending on an individual's exercise experience and ability to perform exercise. Physical injury is deeply related to the characteristics of the event, and mainly the direction of movement, the angle of the joint, and the degree of exercise performance of the individual are deeply related to the degree of exercise injury. This phenomenon has already been published through previous studies (Lee Sun-ki, 1986), and coaches and players have become very interested in preventing injuries in sports. Foster (1998) said that competitions in anxiety, frustration, or discouragement in sports are more susceptible to injury than emotionally controlled athletes, often directly affecting nerve or physical responses, while increasing or restraining athletes' stress and ambition

2.2. Causes of Special Martial Arts Injuries

The causes of special martial arts injuries are largely divided into internal and external factors. Injuries caused by internal factors are injuries caused by excessive training, that is, inadequate exercise, insufficient technology, and improper training methods, and injuries caused by external factors refer to injuries caused by external forces such as others or training environments. External factors are related to actual exercise events, exercise methods, various conditions, and protective equipment, and internal factors are related to individual physical and mental characteristics. In addition, the main cause of injury is internal in events without direct physical contact with the other party, and the more physical contact, the higher the incidence rate is due to external factors (Social Sports Guidance Theory Compilation Committee, 1991). Any type of martial arts requires more than a certain level of muscle strength, endurance, skill, speed, agility, and so on, that professional athletes as well as ordinary people are always exposed to the risk of physical injury in martial arts (lower rights, 1985). The causes of sports injuries are numerous, but the basic conditions are as follows: (1) excessive training (2) physique (3) muscle imbalance (4) incorrect training methods (5) lack of flexibility (6) lack of attention (7) lack of warm-up exercise (8) excessive tension (9) facility and environmental defects

2.3. Types of martial arts injuries

Injuries without injury are largely classified into injuries caused by internal factors and injuries caused by external factors. First of all, in the case of internal injury, this is an injury caused by the trainee's physical activity itself, and an example is tennis elbow, which is caused by sudden and strong muscle contraction, or muscle fatigue due to insufficient skills or excessive muscle contraction. The main causes include exercise or insufficient skills in unsuitable physical conditions, incorrect training methods, physique problems, lack of flexibility, muscle imbalance, and excessive tension. In the event of such internal injury, most of the prevention is possible by appropriate condition control and improvement of training methods. External injury refers to injury caused by external force between external objects, and the main cause is defects in equipment and equipment facilities or environmental defects. Muscle insulation, Achilles tendon insulation, fracture, sprain, and dislocation are the most frequent trauma. The causes of external injury include defects in equipment, equipment, facilities and environment, lack of physical examination, and the use of proper conditioning and training methods, joint guards and tape, as in internal injury, can reduce the frequency of injury (Kyung Ok Lee, 1999).

(1) external injury

External injury is a frequent injury to martial arts trainees, and unlike internal injury, it can be seen as caused by others or external objects, and martial arts majors often neglect themselves in situations where they exceed their physical limits or force is imposed (Jeong-jin, 1994).

They have a false notion that they think of it as a natural injury because it occurs a lot in sports such as basketball, soccer, or speculative events that usually cause physical fights. It should be noted that such external injuries can contribute to the prevention by appropriate condition control or improvement of training methods. In addition, wearing helmets, joint guards, assistants, or taping can be prevented by reducing the frequency, strengthening safety rules and rules, and improving stadium conditions in soccer, boxing, and gymnastics. External injuries can be again divided into various forms such as fractures, joint-ligament damage, situations, concussions, bents, stab wounds, wounds caused by friction, dislocations, and attales depending on the light type at the site.

(2) It hurts inside

Internal injury is an injury caused by one's own muscle contraction and refers to an injury caused by the internal force of the body. The main cause is due

to excessive exercise or insufficient skills in an inappropriate physical condition, and it can be said that the reason is the improper training method and condition control. Therefore, most internal injuries can be prevented by proper conditioning and improvement of training methods (Ha Kwon-ik, 1985)

3. Prevention of Special Martial Arts Injuries

In order to prevent special martial arts injuries, find physical defects or inappropriate conditions, identify weak areas and unbalanced areas of oneself, and find ways to participate in martial arts training safely for physical problems (Jung Il-gyu, 1995). It is also important to protect yourself from injury by wearing taping or protective pads. It should not be forgotten that conducting safety inspections of the facilities and supplies of the martial arts training center itself, paying attention to hygiene, and cleaning up the mental posture for martial arts training is a shortcut to prevent physical and mental injury.

For the general public or trainees who participate in dance activities, the prevention of injury is very significant. No matter how good a martial arts activity is, if you are injured and do not work properly, it will interfere with your social life or your life as a player. Prevention and position of injury-free injury are essential both internally and externally, especially the prevention of injury is a prerequisite, and in this regard, it is required to minimize the cause of injury (Social Sports Guidance, 1991). There are many ways to prevent injury-free injury, but this study summarized it as follows

1) Warming up and cleaning up

Warm-up exercises gradually increase energy release and muscle temperature to facilitate coordination between human tissues, thereby reducing the risk of sports injury caused by imbalance between human tissues. Warm-up exercises should start with large muscles with high blood vessel distribution density, and after these basic warm-up exercises, more detailed warm-up exercises are performed. At this time, stretching of muscles and joints is essential, but overload of the outer part of the joint should be avoided (Petersen, L.etal., 1986). The final stage of the warm-up exercise is a special exercise for each event, and the overall warm-up should be carried out gradually for at least 15-20 minutes.

In addition, it is desirable to change shirts and wear jumpers again to prevent rapid cooling of muscles after warming up, and finishing exercises such as jogging and stretching are recommended.

2) Improvement of protective equipment, equipment and rules

The most important of the sports equipment shall be the shoes designed orthopaedically to protect the

foot from damage, especially the sole of the shoe shall be able to absorb the impact. Uniforms are no less important protective gear than shoes. In particular, it should be designed to smoothly dissipate human heat. Since the main outlets of human heat are around the neck, around the waist, wrist, reproductive organs, and ankles (Pe-tersen, L.etal., 1986), a uniform design is required to properly expose and set-off the area. Since existing elbow pads and knee pads do not properly prevent side shocks or rear clips from falling, improvement of special protective equipment is urgently required for each sport. In addition, care should be taken not to cause sports injury by thoroughly following the rules of wearing protective equipment.

3) a scientific training program

The training program is designed to gradually strengthen human tissues, especially muscles and skeletal systems

It should be organized to prevent sports injuries and improve performance. At the same time, it is important to focus on 'mobility and flexibility' training to improve speed and skills, which not only supports the movement of the musculoskeletal system, but also improves joint flexibility to prevent injury to these tissues. The flexibility required for many events is a combination of joint mobility, strength, coordination between human tissues, and the 'proprioception' of human tissues. However, during excessive training, the motor muscles EH may cause an imbalance between joints, resulting in chronic muscle and skeletal injuries such as tennis elbow in young athletes (Petersen, L.etal., 1986). Therefore, the training program should consider not only the balanced improvement of each muscle and skeletal system, but also the ability to interact and coordinate between the nervous system, muscles, tendons, ligaments, and joints. In addition, leaders and coaches should identify muscle and skeletal areas where players are overloaded or injured in a specific event, and make efforts to improve flexibility and stress.

3. Research method

3-1) Subject of the study

The subjects of this study were a population of special martial arts officials currently located in A, Gyeonggi-do, and a total of 292 copies of the survey were used for analysis, excluding 8 faithfully answered data from the questionnaire

3-2) Research procedures

For this study, the researcher randomly selected special martial arts located in A-si, Gyeonggi-do, and after the instructor distributed the questionnaire to the subjects, the contents of the questionnaire and the purpose of the questionnaire were fully explained and collected.

- 1)Literature Survey: 2009.04.03-2009.11.25
- 2)Preliminary survey: December 10, 2009-12.19
- 3)Final questionnaire completed: 2010.02.20-03.20
- 4)Data Analysis: 2010.03.25-2010.04.20
- 5)Writing a thesis: 2010.04.05-2010.06.1

3-3) Survey tools

The purpose of this study is to investigate motor injuries that occur during special martial arts training, and a questionnaire was used as a data collection tool. The questionnaire used in this study was partially revised and supplemented according to the characteristics and purpose of this study by referring to the questionnaire used in the previous studies such as (Kang Jae-young (1998), Jeon Tae-hoon (2000), and Cho Myung-hwan (2002)). In this study, the significance level was $\alpha = 0.05$ as a result of a preliminary survey to increase the reliability of the selection of the injured area using the Cronbach's coefficient. The level of reliability was generally high from 65 to 89. The composition of the questionnaire consisted of a total of 23 questions, including 4 demographic variables, 5 variables for injury experience by part, 5 variables for type and timing of injury, and 9 variables for recognition and treatment of injury.

3.4) Data processing method

Among the questionnaires collected in this study, unfaithful and unresponsive questions were excluded, and only valid questions were coded and descriptive statistical analysis was conducted using Windows SPSS Ver15.0.

4. Results and discussion

This chapter summarizes the results of analysis focusing on the area, type, and timing of injuries that occur during training, and the recognition and treatment method of injuries for special martial arts trainees.

4.1. Injury experience by part

1)an injured area

It is the result of a study on the injured area. In the injured area, muscle and ligament injuries accounted for the highest rate at 45.2%, followed by joint injuries at 30.5%, bone injuries at 14.0%, skin injuries at 9.9%, and brain injuries at 0.3%. This result is because the muscles, ligaments, and joints formed in the arms and legs are used to move and hit, and it is considered that repeated stimulation by external trauma and muscle contraction is excessive or an injury caused by an imbalance of force in the body. A study by Kim Soon-ki (2001) and Kim Jung-soo (2003) also reported that the proportion of

injuries to legs, arms, and muscles and ligaments was the highest.

2)symptoms of skin injury

Looking at the symptoms of skin injury, incision was the highest at 42.1%, followed by abrasions of 32.2% and fever of 25.7%.

Special martial arts trains the skills of bending, throwing, hitting, and kicking to learn skill-based self-defense. Self-defense techniques of these special martial arts skills are often trained in pairs, and if attackers and defenders do not work together, skin injuries often occur. In a study of judo trainees by Ka Kyung-hwan (1998) and Kwon Tae-hee (2006), the frequency of abrasions and incision injuries was also high.

3) Muscle and ligament damage

In terms of muscle and personal injury, muscle injuries showed the highest rate at 62.7%, followed by muscle contusion at 27.4%, muscle stiffness at 9.2%, and dryness at 0.7%. When training frame martial arts, it often causes muscle and ligament damage when falling and hitting, which receive self-defense skills. Kwon Tae-hee (2006) was found to have a high frequency of injury to muscle bruises and muscle injuries, and Lee Won-hee (2010)'s study of speculative sports trainees also showed the highest frequency of injury to sprains and bruises.

4) a bone injury

Looking at bone injuries, bone bruises were the highest at 81.8%, followed by fractures at 15.8% and osteoarthritis at 2.4%. These results are also judged to be the result of contact with the other party's body parts during training through hitting and confrontation, unnatural movements and landing during defense, and carelessness of the person. Previous studies of Taekwondo trainees also showed high frequency of injuries such as bruises, sprains, and dislocations (Lee Kyung-soo, 2005; Cho Young-mook, 2008).

5) a joint injury

Looking at joint injuries, sprains showed the highest rate at 76.7%, followed by joint seatedness at 19.5%, arthritis at 2.1, ligament and insulation at 1.0%, and dislocation at 0.7%.

Special martial arts self-defense skills include various skills such as bending, throwing, hitting, and kicking. It can be seen that various joint injuries are caused by these various technical training. In the study of Kwak Dae-sung (2000), the frequency of injury of the joints was consistent with the results of the study, in the order of sprains, joint seating, ligament elongation, and insulation.

4.2) Timing and cause of injury

1) Injury by technology type

Among the special martial arts training, fall and gymnastics were the highest at 71.6%, with 18.4% of form (pomsae), 7.9% of footwork (kicks), and 2.1% of martial arts training, and the cause of injury is thought to be due to the trainee's overconfidence and carelessness. In the case of elementary school students, it can be seen that they get hurt a lot when they are judged, when their friends are watching, and when they are overconfident in their skills and training. A study of judo players by Lim Hye-ran (2010) and Kim Soon-ki (2001) also reported that training accompanied by falling methods such as waist and leg skills and excessive desire to win cause many exercise injuries.

2) injury after training

The time of injury was 58.2% after suffering from injury after training, and 41.8% during training. Special martial arts leaders are often run by one or two leaders, and since one leader has to perform many tasks in addition to vehicle operation, organization, and martial arts training, the attention and attention of the leader or master may be neglected after training, and personal training after training is exposed to injury. In a study by Lee Seung-beom (2009), the results of the study support the results of this study that the lower the attention after training, the higher the frequency of injury.

3) Monthly Injury Period

Looking at the time of injury, November-December showed the highest rate of 41.8%, followed by January-February 26.0%, March-April 23.3%, September-October 5.8%, May-June 1.7%, and July-August 1.4%.

These results show that the most injuries in winter are caused by contraction and narrowing of the range of motion. In terms of hot weather, the highest rate was 41.8% in November-December, 26.0% in January-February, 23.3% in September-October, 1.7% in May-June, and 1.4% in August. These results show that the most injuries are suffered in winter when muscles contract and the range of movement is narrowed, and the hot weather relieves muscle tension and significantly reduces injuries in summer when enough sweat and body temperature can be raised even with a short warm-up. A study by Lee Kyung-soo (2005) and Kim Jeong-ju (2006) also showed that the frequency of injury in winter was the highest, requiring attention to prevention of injury in winter

4) the time of injury

Looking at the time of injury, 47.5% was the highest rate during competition training, 45.9% during free time, 3.8% during recreation, 2.1% during type (pomsae), and 0.7% during preparation/organization exercise. As shown in the previous results, it can be seen that physical contact with the other

party through competition and the leader's indifference and negligence in free time can be factors that cause injury. In a study by Kim Sung-ho (2003), it was also found that the occurrence of injury during competition and free time was the highest.

5) Cause of injury

In particular, the use of teaching aids was the highest at 37.0%, with 19.2%, 12.7% in conflict, 12.3% in training, and various hitting techniques and techniques, as well as various weapons (double-cutting, stick, sword, fan, cane, bamboo). At this time, it can be seen that the use of weapons due to carelessness or training with unfamiliar weapons shows a high frequency of injury. Choi Yoon-young (2007) said that depending on the material of the mat of the Taekwondo studio, various injuries can occur, and various injuries occur during the use of the parish.

4.3) Perception and treatment of injury

1) Place of treatment

Looking at the post-injury treatment places, the highest percentage was 35.3%, followed by hospitals with 33.2%, homes with 29.1%, and oriental medicine with 2.4%. According to these results, most of the areas injured in special martial arts training are considered to be the result of many minor injuries that can be treated first in the paint, and leaders often give simple first aid before going to the hospital second. In a study by Kwak Dae-sung (2000), the most common treatment was in hospitals and at home, and in a study of athletes in speculative sports by Lee Won-hee (2010), it is reported that hospital treatment, himself, and oriental medicine are treated in combination

2) Post-Injury Treatment Period

These results show that most accidents in special martial arts seals have a short treatment period due to many minor injuries, but since the treatment of injuries causes another injury, efforts should be made to complete the injury through continuous treatment. In a study by Han Sang-hee (2005), the duration of injury treatment for Taekwondo gym trainees was the most within one week, and Lee Kihoon (2004) was the same as the results of this study, with the results of this study.

3) First aid after injury

Looking at the first aid immediately taken after injury, ice packs showed the highest rate at 58.9%, followed by rest at 21.9%, immediate return at 12.3%, endured at 4.2%, and hospital evacuation at 2.7%. These results show that most of the injured areas require a primary ice pack due to injuries such as muscle pain or muscle injury, and these treatments are appropriate as an alternative to preventing secondary injuries. In a previous study by Han Sang-hee (2005), many respondents said they just

endured or took a rest, but it is judged that they are now familiar with basic injury prevention methods due to the generalization of nausea and various daily sports.

4) Perception of First Aid after Injury by the Leader

Looking at the leader's perception of first aid after injury, it was normal at 68.1%, followed by 18.5% proper, 6.5% very appropriate, 4.5% inappropriate, and 2.4% very inappropriate. As a result, it was found that the injury that the leader of the special martial arts seal can provide first aid was very limited and appropriate measures were insufficient. Lee Kyung-soo (2005) and Kim Sung-ho (2003) said in a study of Taekwondo trainees, 46.5% and 42.9%, whereas special martial arts leaders responded with a low frequency of 6.5%, indicating the difference between leaders according to events.

5. Conclusion

The purpose of this study is to minimize the occurrence of injury and protect trainees from injury by studying the causes and events of injury in special martial arts training, and the degree of injury according to the method of training. To achieve this research purpose, a total of 292 data were used using the cluster random sampling method after setting special martial arts trainees currently located in A area of Gyeonggi-do as a population. The survey tools were modified and supplemented according to the characteristics and purpose of this study by referring to the questionnaire on motor injury used in the studies of Kang Jae-young (1998), Jeon Taehoon (2000), and Cho Myung-hwan (2002). Descriptive statistical analysis was conducted using SPSSPC+ Ver15.0 for WINDOWS for data processing. Through this procedure, the conclusion of this study on injuries during special martial arts exercise is as follows.

1) Injury experience by region

The injured area was found to have the most muscle and personal injury, and the symptoms of skin injury were found to have the most incision. In personal injury, muscle injury was found to have the highest frequency of injury, bone bruising was found to be the highest, and joint injury was found to be the most common injury of sprain.

2) Time and cause of injury

In the case of special martial arts training, injuries occurred the most when training the fall technique and the inner body technique, and it was found that more injuries occurred after training than during training time. In terms of time, a lot of injuries occur from November to February, which is winter,

and in time, a lot of injuries occur during competition and free time. The cause of injury was found to be the most common occurrence when using teaching aids and when overconfidence in ability.

3) Treatment and Perception of Injury

The most common post-injury treatment places were stamps, and first aid was ice packs. The treatment period was the highest for 1-7 days, the recovery period was the highest for less than 1 week, and the result after injury treatment was the most pain relief. The leader showed the highest frequency of "simply explained" the injury, the leader showed the highest frequency of "normal" first aid after the injury, and the body condition before the injury showed the highest frequency of "just so."

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Profile

Byun Kyung Won (moo35067381@nate.com)
Chungbuk National University Crisisonomy Cooperation Course