Abstract

Martial arts and combat sports are very popular and it is necessary to draw attention to prevention of practitioners’ injuries. Knowing the risks develops efficient strategies for trauma prevention. Martial Art, Judo, Wrestling, Boxing, Kick-boxing and M.M.A are sports with a high rate of injuries during the trainings and competitions. Combat sports and martial arts are classified in the first group of risk of an injury due to implicit contact.

Keywords: injuries, martial arts, judo, wrestling, boxing, M.M.A, kickboxing.

JEL classification: Y30, Y40, I190

Introduction

Due to great popularity of martial arts and combat sports it becomes necessary to draw attention to prevention of damages with practitioner. How do we define combat sports and martial arts? “Combat sports are customarily called a group of those sports which essence of competition consists in direct combat of two competing sports persons” (Wojciech, 2008) I research in this sense sports like karate, ju-jitsu, judo, boxing, wrestling, kickboxing, and mixed martial arts.

Comprehensive knowledge about the risk of injury during sport activity and related risk factors represents an essential basis to develop effective strategies for injury prevention.

The search strategy was based on a comprehensive survey of the undertaken literature. It is a review of the literature on the various types of combat sport-related trauma.

Content

MARTIAL ARTS are a popular form of exercise and sport worldwide. There are hundreds of different styles of martial arts, each being mechanically, philosophically, culturally, and geographically diverse. Martial arts can result in a wide array of injuries. The injury type is often dependent on the particular form of martial art being performed. Many forms of martial arts are actually non-contact and these tend to result in overuse injuries. Contact martial arts vary widely in their techniques, rules, and protective equipment and these factors affect the injuries and injury rates.

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Specific injuries in martial art are: concussions, cuts, bruises, lacerations, neck injuries, and fractures and joint dislocations.

- **Common symptoms of concussion** include headache, dizziness, nausea, balance problems, difficulties with concentration, and memory problems. Symptoms can last from several minutes to days, weeks, months, or even longer in some cases. Martial arts that emphasize striking and throwing are more likely to result in concussions.
- Striking and grappling can result in minor injuries such as **cuts, bruises and lacerations**. More serious injuries, such as fractures of the nose, face, or skull as well as significant injuries of the eyes mouth or teeth can result.
- **Bruising and abrasions of the neck** are most common and are minor injuries. But, some forms of martial arts, do allow choking techniques that can result in **loss of consciousness**. It's important to understand the risks of different forms of martial arts and to learn them under appropriate supervision.
- **Fractures and joint dislocations** of the extremities are less common, but can occur in styles that use throws and joint locking techniques.

In karate 69% of injuries happened during sporting fight, however, majority of those happened during competitions – 56%. It was only 13% that happened during training fight. Injuries are sustained quite often during training. (25%) . The most frequent injuries in ju-jutsu are broken bones (26%), a significant group of injuries is also a group of knee injuries (19%). 12% are other injuries which includes individual injuries such as tensioned muscle, eye injury, shoulder injury. In 54% of cases injuries in ju-jitsu happen during fight but much more during competition (46%) than during training fight (only 8%). A large number of those occur during training (31%) (Wojciech, 2008).

After soccer, **JUDO** is the most practiced sport in the world. It is on 11th place into the Olympic sports by the number of trauma and injuries, 1211 accidents during 1988 and 2000 at the Olympic Games (Rosu 2003). In judo the injuries are:

- **Back pain** is caused as a result of repeated falling, lifting, stretching and twisting. Lifting opponents can put pressure on the back muscles which may cause them to strain; this will often cause pain both during and after the activity. Sharp lifting movements can be particularly dangerous and can lead to ligament and muscle sprains and tears.

- **Slipped, or prolapsed, discs** are occurred when one vertebrae slips on to the vertebra beneath it. Common symptoms of a slipped disc include severe back pain, restricted movement and nerve root pain (this is caused when a slipped disc puts pressure on a nerve ending).

- **Spinal injuries** are relatively rare, but the constant physical contact and repeated heavy landing on the ground in judo can increase the risk of suffering from a spinal injury. Spinal injuries are usually serious and can be potentially life-threatening. Spinal injuries are commonly caused by
high speed impact with an object surface or another person, accidents and falls. Landing awkwardly after a fall can have serious implications for the spine. Spinal injuries imply a degree of damage to the spinal cord which may, in mild cases, temporarily affect sensations and feelings; more serious injuries can cause partly or complete paralysis and even death.

- **Cuts and bruises** are part and parcel of judo as it is a contact sport. Cuts are usually superficial and bruising usually results from bleeding under the skin and will usually appear after an incident has occurred.
- **Knee injuries** are the most common injury in judo due to quick changes of direction, repeated falling and constant physical contact.

### Types of knee injury

- **Ligament damage** Ligaments are frequently damaged in judo; this is generally caused by changing direction quickly and landing awkwardly.
- **Ligament sprains** may be minor or major depending on the nature of the injury and the extent of the damage; sometimes more than one ligament can be sprained.
- **Ligament tears** are often extremely painful and can have long-lasting effects. Ligament tears usually occur as a result of direct impact to the knee; this commonly causes the knee to buckle. Tears to the exterior ligaments (the medial and lateral collateral ligaments), which run on the outside of the joint are often less serious than those that affect the cruciate ligaments (the anterior and posterior cruciate ligaments) which are located inside the knee joint; however, these injuries are still serious and will usually need a period of at least 6 weeks to recover.
- **Cartilage tear** It is more common for the lateral meniscus, which is located on the outer side of the knee, to be damaged than the medial meniscus, which runs on the inner side of the joint. Cartilage tears are usually caused by a sudden movement or a movement which carries on while the foot is still planted on the ground.
- **Dislocations** Kneecap (patellar) dislocations are much more common than knee joint dislocations; in the event of a kneecap dislocation, the kneecap becomes displaced from its position at the end of the femur, changing the visible appearance of the knee. Often, the kneecap can be placed back in its original position fairly easily. Knee joint locations are much more serious and involve the tibia becoming detached from the end of the femur.

### Shoulder injuries:

- **Acromioclavicular joint sprain (AC joint)** The acromioclavicular joint joins the clavicle (collarbone) to the scapula (shoulder blade); this can clearly be identified as the bony mass on the top of the shoulder. This joint can become sprained as a result of direct contact, high speed impact or falling onto the shoulder or an outstretched hand; this causes pressure to radiate up the arm to the collarbone.
• **Dislocation** shoulder joint are usually caused by high speed impact or a fall. In judo, dislocations are often caused as a result of landing forcefully or awkwardly after being ‘thrown’.

• **Impingement syndrome** This condition is common in swimmers and throwers but can also be common in judo thanks to the action of ‘throwing’ an opponent. Impingement syndrome is primarily caused by inflammation of the tendons surrounding the rotator cuff muscles during the process of travelling through the subacromial space; this causes the tendons to swell, causing there to be a decrease in the space available for movement; subsequently movement becomes restricted, or impinged as the tendons get trapped.

In 59% of cases injuries happened during competition fight, 25% in training fight. Only 8% of injuries occurred during training (Wojciech, 2008)

**WRESTLING**, one of the world's oldest sports, is offered at various levels of competition, including the Olympics, national, European, international tournaments. It's a sport for all sizes of people, and both male and female participants compete, even at the Olympic level. It is on the 7th place of Olympic sports with a great rate of trauma, 1977 accidents between 1988 and 2000. (Rosu 2003). Competition rules require that athletes be paired against each other according to their weight class. Some competitions require that contestants be matched by age, experience, and/or gender. Injuries do occur, particularly in the knee, shoulder, skin, and head.

The injuries include **concussions, scrapes, bruises, tongue cuts**, and **cauliflower ear**. However, **knee and shoulder injuries** occur with more severity than all other injuries and are responsible for the most lost time, surgeries, and treatments.

**Cauliflower ears** are caused by severe bruising of the ear structure. The resulting injury may need to be drained and the ear wrapped in a casting material to retain ear shape once the swelling has subsided.

**Prepatella bursitis** is the inflammation of the sac (bursa) located in front of the kneecap (patella). For wrestlers, this area is constantly hit into the mat, often causing sharp pain and sometimes swelling.

**Knee ligament injuries** can also occur during wrestling, most commonly to the inside (Medial Collateral Ligament – MCL) or outside (Lateral Collateral Ligament- LCL) of the knee. These injuries are often the result of the leg twisting outward from the midline of the body.

Epidemics of **skin infections** have been known to spread quickly from team member to team member with the three most common infections in wrestlers being **herpes simplex, ringworm, and impetigo** because exists so much skin-to-skin contact,
BOXING is on the 6th place of Olympic sports in order of the injuries with 2365 accidents between 1988 and 2000. (Rosu 2003). Besides expected contact injuries, boxers tend to suffer upper extremity injuries, including wrist, elbow, and shoulder sprains. Shin splints, Achilles tendinitis, plantar fasciitis, and knee and leg tendinitis can occur due to repeated short, quick steps and jump-rope training.

The American Association of Neurological Surgeons says that 90% of boxers will have sustained a brain injury by the end of their careers. Couple that with eye injuries and dementia, which are both effects of being hit in the head. Continuing to box after receiving a concussion leads fighters to stutter, stumble and end up suffering what doctors call pugilistic dementia.

M.M.A. „About one-third of professional mixed martial arts matches end in knockout or technical knockout, indicating a higher incidence of brain trauma than boxing or other martial arts, according to a new study in the American Journal of Sports Medicine Professional mixed martial arts includes elements of wrestling, judo, boxing and kickboxing inside an enclosure with fighters wearing small, fingerless gloves and no headgear”(Associated Press, 2014).

Mixed martial arts (MMA) have enjoyed a tremendous growth in popularity over the past 10 years, yet there remains a paucity of information with respect to common injuries sustained in MMA competitions. In the available studies, certain trends pertaining to risk factors for injury, as well as the most common injuries sustained in MMA competition, were noted. Common risk factors include being the losing fighter, history of knockout or technical knockout, and longer fight duration. In a recent meta-analysis of the available injury data in MMA, the injury incidence rate was estimated to be 228.7 injuries per 1000 athlete-exposures (one athlete-exposure is defined as one athlete participating in a single fight). The estimated injury incidence rate in MMA is greater than in other full-contact combat sports such as judo (44.0 injuries per 1000 athlete-exposures), taekwondo (79.4 injuries per 1000 athlete-exposures), amateur boxing (77.7 injuries per 1000 athlete-exposures), and professional boxing (118.0-250.6 injuries per 1000 athlete-exposures). The most commonly injured body region is the head (66.8% to 78.0% of reported injuries) followed by the wrist/hand (6.0% to 12.0% of reported injuries), while the most frequent types of injury were laceration (36.7% to 59.4% of reported injuries), fracture (7.4% to 43.3% of reported injuries), and concussion (3.8% to 20.4% of reported injuries) (Lystad, 2014). In preliminary results reported in April 2012 as part of an ongoing study of a 109 professional boxers and MMA fighters being conducted by Dr. Charles Bernick and his colleagues at Cleveland Clinic’s Lou Ruvo Center for Brain Health, fighters with more than six years of ring experience were observed to have reductions in size in their hippocampus and thalamus whereas fighters with more than twelve years of ring experience were observed to have both reductions in size and symptoms such as memory.
loss (Wikipedia). In the period of 2007 to 2010, there were two fatalities in mixed
martial arts matches. The first was the death of Sam Vasquez on November 30,
2007. Vasquez collapsed shortly after being knocked out by Vince Libardi in the
third round of an October 20, 2007 fight at the Toyota Center in Houston, Texas.
Vasquez had two separate surgeries to remove blood clots from his brain, and
shortly after the second operation suffered a devastating stroke and never regained
consciousness. The second death stemming from a sanctioned mixed martial arts
contest occurred in South Carolina on June 28, 2010, when 30-year old Michael
Kirkham was knocked out and never regained consciousness. He was pronounced
dead two days after the fight (Sievert, 2007).

KICK-BOXING In kick-boxing the most frequent injury is broken nose (60%),
the second frequent injury is broken other bones (16%). The remaining injuries are
spine injuries, fractured ribs, Parkinson’s disease and sprains of knees. None of the
contestants showed lack of injury during sporting career. In kick-boxing one may
state that injuries most often occur during training fights (79%), only 14% of
injuries happen during competition fight and 7% during training (Wojciech, 2008).

Conclusions

- This study was designed to assess the prevalence, distribution, and patterns
  of injury among athletes engaged in combat sports.
- Facial trauma is a part of combat sports and martial arts. Oral and
  maxillofacial injuries are thus common in athletes engaged in these sports.
- Many sports have neurologic injury from incidental head contact, but,
  combat sports allow head contact, and a potential exists for acute and
  chronic neurologic injuries.
- The fact that majority of martial arts and combat sports practitioners
  sustained at least one injury during their sporting career may suggest a high
  level of danger connected with practicing these sports.
- Combat sports and martial arts are classified in the first group of risk of an
  injury due to contact.
- Majority of injuries happen during competition fights. It may result from
  the fact that it is then when contestants fighting with great dedication
  forget about the risk. Aiming at victory at any cost they put themselves in
  danger of an injury.
REFERENCES