

## KINESIOLOGY

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### Type, incidence and causes of injuries in karate tournaments

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**Key word:** karate, sport injuries, safety

#### Abstract

**Introduction:** Karate is the world's most popular martial art and like any competitive sport it focuses on high performance, and the health and safety of participants. Many sports injuries are reported in karate competitions. According to these reports, scientific advice is given to reduce and prevent injuries. Therefore this study was conducted in order to evaluate common injuries in the sport of karate.

**Methods:** In this research the most frequently occurring injuries at selected tournaments of the Iranian National Karate team in 2009 were evaluated. 385 competitions in seven weight categories of the best Iran karate athletes were held in these tournaments. An injury report form was completed and reviewed by researchers and a tournament doctor. Descriptive and inferential (chi-squared test) methods were used to analyze the data.

**Results:** results showed 143 injuries during the tournaments. 65.7% occurred in the evening. Trauma was the most common injury (74.8%). 69.9% of injuries occurred to the head and neck. 91.6% of injuries occurred to the upper limbs. The most injuries (50%) occurred in the second minute of the tournament and the cause of injuries in 65.7% was the opponent's punch. 65.8% of injuries were treated by using ice packs and anaesthetic sprays and in only 3 cases were athletes transferred to hospital.

**Discussion and conclusion:** It seems that by the changing regulations and using head and face protective equipment and being aware of the common injuries in karate, we can reduce most injuries in this sport.

#### Introduction

Exercise is one of necessities of human life. Today, in a civilized world we can hardly find someone who is deprived of beauty and excitement of sport [Bebary 2009]. Nevertheless, on the one hand there are beauty and excitement for athletes, coaches and spectators and on the other hand there are hardships, pressures, training problems and injuries will have the most negative impact on athletes and coaches [Nouzari 2010]. Karate is the world's most popular martial art and focuses on high performance, health and safety of participants, like any competitive sport [Behboudi 2007]. Many sports injuries are reported in karate competition [Salesi 2006]. According to these reports, the scientific advice is given to reduce and prevent injuries [Khodabakhsh, Nouzari 2008].

Based on Zetaruk *et al.* study [2005] of five martial sports, they reported the smallest number

of injuries in Taekwondo is three times more than karate [Zetaruk *et al.* 2005]. But in another, descriptive epidemiological, study by McPherson and Picket [2010] of martial arts, most martial arts injuries were in karate and the lowest damage was in tai chi [McPherson, Picket 2010].

In the study that Pappas [2007] conducted on three important sports and games- boxing, wrestling, and martial arts - injuries in martial arts were less common than in two other sports [Pappas 2007]. In their study with the title of “Injury profile in competitive karate” and by analyzing three successive world matches, Arriaza and Leyes [2005] reported punch blows (82.7%) as the main cause of injuries, head and face as the injured areas (72.5%), and contusion as the main type of injury (50.3%). Also, the 6-year study by Macan *et al.* [2006] demonstrated that new judging rules have

led to reduced injuries in karate matches. They asserted that strict judging and heavy penalties for uncontrolled blows, particularly for the youngest competitors, can significantly decrease the risk of injury. Arriaza *et al.* [2009] in their study also showed that applying the new competition rules to karate lead to a dramatic decline(s) in injury rates making karate competitions safer for athletes. So the present study was aimed to examine common injuries in karate tournaments.

## Methods

In this study the number of occurring injuries was examined in Iran karate national team selective tournaments of seniors who were dispatched to Romania International Karate Championship in 2009. 385 matches were held in these tournaments in seven weight categories of the best Iran karate athletes. The research instruments were standardized questionnaires to measure the prevalence, type and mechanisms of karate athletes' injury and completed by the researchers and tournaments' doctors. Descriptive and inferential (chi- squared test) methods were used to analyze the data.

## Results

Findings showed 143 injuries during the tournaments. In every 2.4 competition, an injury occurred and in every competition there were 0.42 injuries. Table 1 shows the distribution of injuries.

Based on this table significantly the most types of injuries are related to trauma 74.8% ( $\chi^2 = 174.1$ ,  $p=0.031$ ) and the most injuries (69.9%) are related to head and face ( $\chi^2 = 202.3$ ,  $p=0.007$ ).

Table 2 shows the mechanisms and severity of injuries which happened in competitions.

Results show that the time injuries occurred during a competition were as follows: in the second minute (50%), in the first minute (21%), in the third minute (27%) and extra time (2%).

Also 65.7% of injuries happened in the evening and the others happened in the morning. 51.4% of injuries were treated with the use of ice packs, 14.4% cold spray, 18.8% cotton and sterile gauze, 4.4% topical gel and washing, and only three cases were transferred to hospital.

## Discussion and Conclusion

Research's findings show 0.42 injuries in any competition which was consistent with other findings of researchers Tuominen [1995], Arriaza, Leyes [2005], Khodabakhsh, Nouzari [2008]. Tuominen [1995] reported 0.28 of injuries in any competition in Finland national karate completions [Tuominen 1995]. Khodabakhsh, Nouzari [2008] in their studies stated 0.26 of injuries [Khodabakhsh, Nouzari 2008]. Arriaza and Leyes [2005] by analyzing three consecutive world championships reported 0.31% occurrence of injuries in any competition [Arriaza, Leyes 2005]. Comparing these results with other countries indicate the high number of injuries in competitions in Iran.

The results of evaluation in a different area in body significantly indicate that the number of injuries to the head and neck are more than other parts of the body. These results are consistent with the findings of Helabchi *et al.* [2007], Arriaza, Leyes [2005], Arriaza [2003], Pieter [2000], Critchley *et al.* [1999] and Hillman *et al.* [1993]. Also they are not consistent with findings of Khadkshesh, Nouzari's

**Table 1.** Distribution of injuries

Percent	Number of injuries	Injury type	Percent	Number of injuries	Injured area
74.8%	107	Trauma	69.9%	100	Head, neck & face
15.4%	22	Contusion	11.9%	17	Trunk
8.4%	12	Bleeding	9.8%	14	Upper limb
1.4%	2	Sprain	8.4%	12	Lower limb

**Table 2.** Mechanisms and injuries severity

Percent	Number of injuries	Injury severity	Percent	Number of injuries	Injured cause
93%	133	Light	65.7%	94	Punch
3.5%	5	Mild	27.3%	39	Kick
1.4%	2	Moderate	7%	10	Fall
2.1%	3	High			

[2008] conclusions may differ because he may have included injuries to young athletes [Khadkhash, Nouzari 2008]. These results also are not consistent with the findings of Bebari [2009] because he based his study on non-control karate (kyokushin karate) competitions. Most kicks in non control karate (kyokushin karate) training and competitions are to the lower limb and very few kicks are to the head and face. control karate (kyokushin karate) training and competitions are in lower limb and very few of kicks are no the head and face.

The study of damaged areas of the body shows that 69.9% of injuries occurred to the head and neck and it considered as miscue. So punching and kicking in these areas means that referee and judging regulations are not fully implemented and athletes try to punch and kick to the head and face to eliminate the focus their opponent [Khodabakhsh, Nouzari 2008]. Results are consistent with the findings of Salesi [2006]. Comparing these results with other countries the high number of head and face injuries in Iran tournaments is indicated.

Due to the 65.7% causes of punch injuries, it seems that the use of protective equipments in different areas of body can be useful in reducing injuries in karate and it should be considered by the supervisors.

In this research most injuries were classified as minor damage which is consistent with other researchers' findings. Contrary to public perception which thought karate is a violent sport [Salesi 2006], a collision with high injury, comparing this with other sports like football, handball, hockey, basketball shows that karate has extremely low injuries rate. Results of this part are consistent with the finding of Nouzari [2010], Salesi [2006], Bebari [2009] and Khadkhash, Nouzari [2008]. So it seems that the injury(ies) problem in karate, which is a field full of medal, should be considered by supervisors, technical managers, coaches and athletes.

Overall we can conclude from the findings that with variation of regulations, using protecting instruments in head and face region, strict judging and heavy penalties for uncontrolled blows, and informing coaches and athletes more often about current injuries in karate can decrease many incidences and accidents of injuries in this sport field.

## References

1. Arriaza R. (2003), *Tournament medical report - Marseilles, France*, World karate federation, [http:// www.karate Athlete.com](http://www.karate Athlete.com).
2. Arriaza R., Leyes M. (2005), *Injury profile in competitive karate: prospective analysis of three consecutive world karate championships*, "Knee Surgery, Sports Traumatology", Arthroscopy, 13, pp. 603-607.
3. Arriaza R., Leyes M., Zaeim kohan H., Arriaza A. (2009), *The injury profile of karate world championships: new rules, less injuries*, "Knee Surgery, Sports Traumatology and Arthroscopy", 17, pp. 1437-1442.
4. Bebari M. (2009), *Injury profile in competition of non-contact karate*, 12<sup>th</sup> Asian Federation of Sport Medicine Congress, Amritsar, India.
5. Behboudi M. (2007), *The study of psychological- mental professional karate athletes in foreign competition and give a new psychological guidelines in order to improve their act in the competitions*, 1<sup>st</sup> International Islamic World Science & Sport Conference.
6. Critchley G.R., Mannion S., Meredith C. (1999), *Injury rates in shotokan karate*, "Br J Sports Med", 33(3), pp. 174-177.
7. Halabchi F., Ziaee V., Lotfian S. (2007), *Injury profile in women shotokan karate champion ships in Iran (2004-2005)*, "J Sports Sci & Med", 6(2), pp. 52-57.
8. Hillman S., Dicker G., Sali A. (1993). *Non contact karate injuries*, "The Aus J Sci & Med in Sport", 25(3), pp. 73-75.
9. Johannsen H.V., Noerregaard F.O. (1988), *Prevention of injury in karate*, "Br J Sports Med", 22, pp. 113-115.
10. Khodabakhsh R., Nouzari V. (2008), *Type, incidence and causes of injuries in elective competition of karate national team*, 11<sup>th</sup> Asian Federation of Sport Medicine Congress, Tehran, Iran.
11. Macan J., Bundalo-Vrbanac D., Romc G. (2006), *Effects of the new karate rules on the incidence and distribution of injuries*, "Br J Sports Med", 40, pp. 326-330.
12. McPherson M., Pickett W. (2010), *Characteristics of martial art injuries in a defined Canadian population: a descriptive epidemiological study*, "J BMC Public Health", 10, pp. 795-801.
13. Nouzari V. (2010), *Injuries in karate championship*, 7<sup>th</sup> International Congress of Physical Education and Sport Sciences, Tehran, Iran.
14. Oler M., Tomson W., Pepe H., Yoon D., Branoff R., Branch J. (1991), *Morbidity and mortality in the martial arts: a warning*, "The J Trauma", 31, pp. 251-253.
15. Pappas E. (2007), *Boxing, wrestling, and martial arts related injuries treated in emergency departments in the United States, 2002-2005*, "J Sports Sci & Med", 6(2), pp. 58-61.
16. Pieter W. (1997), *Fractures in karate competition*, "J Sports Trumatol Relt Res", 1(94), pp. 175-80.
17. Pieter W. (2000), *Injuries and mechanisms of injury in karate competition*, English abstract of 1<sup>st</sup> World Congress on Combat Sports and Martial Arts, France.
18. Pieter W. (2005), *Martial arts injuries*, "J Med Sport Sci", 48, pp. 59-73.
19. Salesi O. (2006), *Trauma epidemiology in the karate sport*, 11<sup>th</sup> Asian Federation of Sport Medicine Congress, Tehran, Iran.
20. Stricevic M.V., Patel M.R., Okazaki T., Swain B.K. (1983), *Karate: Historical perspective and injuries sustained in*

*national and international tournament competitions*, "Am J Sports Med", 1(15), pp. 320-24.

21. Tuominen R. (1995), *Injuries in national karate competitions in Finland*, "Sca J Med & Sci in Sports", 5, pp. 44-48.
22. Weir E.C., Caline T.E. (1997), *Lower limb injuries in karate, an incidence survey*, "J Br Podiatr Med", 5(21), pp. 6-8.
23. Zetaruk M.N., Violan M.A., Zurakowski D., Micheli L.J. (2005), *Injuries in martial arts: a comparison of five styles*, "Br J Sports Med", 39, pp. 29-33.

## Rodzaj, częstotliwość i przyczyny urazów w zawodach karate

**Słowa kluczowe:** karate, urazy sportowe, bezpieczeństwo

### Streszczenie

Autorzy pracy przedstawiają typy częstotliwości oraz przyczyny występowania kontuzji w czasie zawodów karate. Podkreślają oni fakt, iż karate jako jedna z najpopularniejszych sztuk

walki skupia się na wysokich wynikach, a także zdrowiu i bezpieczeństwie uczestników. Ponieważ karate uznawane jest jako sport urazowy celem autorów raportu było zbadanie tego problemu i przedstawienie naukowych rad, które powinny pomóc zredukować lub zapobiegać owym kontuzjom.

Badanie zostało przeprowadzone na irańskich zawodnikach drużyny narodowej biorących udział w Międzynarodowych Mistrzostwach Karate w Rumunii w 2009 roku. W czasie 385 przeprowadzonych walk w 7 kategoriach wagowych zanotowano 143 urazy (65.7% miało miejsce wieczorem). Najczęstszym przypadkiem był uraz (74.8%). 69.9% kontuzji dotyczyło głowy i szyi, 91.6% kończyn górnych. Większość urazów zdarzyła się w drugiej minucie zawodów, a główną przyczyną było uderzenie rywala. 65.8% zranień zostało opatrzone przy pomocy lodu lub spreju znieczulającego, w 3 przypadkach sportowców przewieziono do szpitala.

Na podstawie przeprowadzonych badań autorzy postulują zmianę przepisów sportowych, użycie sprzętu ochronnego na głowę i twarz oraz działania zmierzające do zwiększenia świadomości zawodników dotyczącej wypadkowości w karate.