

Epidemiology of Sport Injuries in National Judokas of Iran

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Original Article

Abstract

Introduction: Due to the nature of the martial art of judo, injuries are very common. Therefore, the purpose of this study is to study sports injuries in male and female judokas of Iranian national teams.

Materials and Methods: This was a descriptive-analytical study in which the subjects included judokas of Iranian national teams (51 and 46 women) who were selected using the purposive and convenience sampling method. The Australian Sports Medicine Injury Standard Questionnaire was used to assess sports injuries. For analysis of information, descriptive and chi-square tests were used.

Results: The results showed that 95.09% of all male and female samples experienced at least one injury. The incidence of injury in all Judokas was 46.39 injuries per 1000 athlete-exposures (A-E). Additionally, the incidence of injury was 54.9 injuries per 1000 A-E in men and 36.95 injuries per 1000 A-E in women. Knee joint (female: 16.18%, male: 26.78%), shoulder (female: 27.94%, male: 13.39%), and fingers (female: 10.92%, male: 17.86 %) suffered the most from sports injuries, but there were no significant differences between male and female genders in this regard ($X^2 = 16.15$, $P = 0.30$). The most common types of injuries were ligament (female: 19.12%, male: 31.25%) and tendon (female: 19.12%, male: 11.60%) injuries, but there were no significant differences in terms of gender ($X^2 = 20.90$, $P = 0.10$). The severity of injury in national male and female judokas was moderate and also the most common mechanism of injury in judokas was trauma to the opposing player (female: 23.53%, male: 50.00 %) and high traction (female: 35.29%, male: 19.64%).

Conclusion: Based on the above findings regarding the high incidence of injury, especially in the knee and shoulder joints, it is necessary in future research to try to use injury prevention strategies to control the mechanisms of injury in national judokas.

Keywords: Professional; Judo; Injury

Citation: Bana V, Mirsafaei-Rizi R. **Epidemiology of Sport Injuries in National Judokas of Iran.** J Res Rehabil Sci 2020; 16: 232-7.

Received: 29.08.2020

Accepted: 12.10.2020

Published: 05.11.2020

Introduction

The occurrence of sports injuries in various sports is inevitable and athletes in different fields are always exposed to various sports injuries. Given the sports injuries in every field, it is noteworthy that these injuries cannot be completely eliminated, but continuous evaluation of injury patterns can provide a focus on designing and evaluating injury prevention strategies in athletes (1). Martial arts have always had a special place among various sports and Judo is one of the most popular Olympic disciplines that is becoming more and more popular among teenagers

and young people. This sport is one of the most popular martial arts (2). 204 countries are members of the International Olympic Committee and 201 countries are members of the International Judo Federation (3).

Athletes need various characteristics, including high physical fitness, to succeed in judo. Participating in judo, on the other hand, requires the athlete to accept the risk of injury. The prevalence of injury in judo is reported to be 4 to 10 per 1000 athletes at risk of injury. The results of a study that examined the extent of sports injuries in the martial arts of judo, boxing, taekwondo, and

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wrestling, showed that the most injuries occurred in judo (4). Because Iranian male judokas are more influenced by the techniques used in wrestling or With-chukhe wrestling, the pattern of injury may be different in Iranian society. Therefore, the need to investigate injuries in Iran is fully felt.

According to the International Judo Federation, there are more than 40 million judo practitioners in more than 200 countries, and sports injuries are a major public health problem (5). A systematic review indicated that the upper limbs, followed by the head and neck, are the most common areas of injury in competitive judo (6). Improper throwing, on the other hand, can hurt both the attacker and the opponent. Compression of the mattress surface due to the landing of the player executing the technique on the opponent, is one of the reasons for injury (about 48%) in young men aged 10 to 19 (7). The application of different techniques in various studies with the incidence of injury has been investigated. For example, the Seoi nage technique, which is throwing the opponent using the arm lever, has been introduced as the most dangerous technique for shoulder injuries. Additionally, the incorrect and uneven execution of the Osotogari technique is associated with increased knee injury. Moreover, the guarding style of competitors has been mentioned as one of the effective reasons for the occurrence of anterior cruciate ligament (ACL) injuries (8).

So far, various studies have been accomplished to compare sports injuries among martial arts. A study examined the prevalence of injuries in the disciplines of judo, taekwondo, and karate in terms of gender, type, mechanism, and vulnerable areas and concluded that in general in these martial arts, the rate of injury in girls is less than that in boys. Considering the vulnerable areas, the upper limbs in judo, the head and face in karate, and the lower limbs in taekwondo are more damaged, and in terms of type of injury, sprains in judo and taekwondo and nose injuries in karate were the most common injuries (9). On the other hand, the high number of individuals interested in the sport of judo, along with the special rules and techniques used in this field, has affected the number of injured people in this sport. Among the studies investigating the prevalence of sports injuries in martial arts in the country, 24% is related to judo (10). So far, there has been very little research on the prevalence of sports injuries in martial arts, especially male and female judokas of the national team, and there was no study on the sports injuries among male and female athletes of the Iranian national teams. Therefore, the present study aims to investigate sports injuries among men and women in national judo teams.

Materials and Methods

This was a descriptive-analytical study that retrospectively addressed the common sports injuries and the factors affecting them among men and women judokas of Iranian national teams during the past year. The statistical population of the study included all male and female judokas of Iranian national teams. The samples were selected using the purposive and convenience method and consisted of all judokas who participated in the camps of the national judo teams of the Islamic Republic of Iran. The number of samples in the men's and women's national judo teams was 51 and 46, respectively. The Australian Standard Sports Medicine Pathology Questionnaire was used to collect data. The validity of this tool in terms of face content and its reliability in terms of translating the English version into Persian have been proved (11).

In order to collect information, the researcher personally attended various national teams and, after the necessary coordination with various coaches and athletes, completed the items in the Australian Standard Sports Medicine Pathology Questionnaire in the form of interviews with the athlete. It should be noted that the information in the questionnaire was confirmed and completed by referring to the information contained in the athletes' medical records. The severity of the injury was determined based on the number of days that the athlete could not attend the competitions due to injury, and the injury rate was calculated per 1000 athletes (12).

The data obtained were analyzed using descriptive statistics such as mean, standard deviation (SD), rate, and percentage and inferential statistics such as independent t-test in SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

Results

68 sports injuries were reported in 46 female judokas with a mean age of 21.1 ± 3.6 years and 112 injuries in 51 male judokas with a mean age of 25.8 ± 5.7 years, most of whom were moderate in severity of injury. The incidence of injury in all judokas was estimated to be 46.39 injuries per 1000 athletes. Moreover, the incidence of injury in men and women was respectively 54.90 and 36.95 injuries per 1000 athletes.

Findings on common areas of sports injuries in male and female judokas of national teams revealed that in female judokas, the shoulder joint was the most affected area with 27.94%, followed by the knee with 16.18% and the finger with 10.29%. In the case of male judokas, the knee joint was the most injured with 26.78%, followed by the finger with 17.86% and the shoulder with 13.39%, but there was not a significant

difference between the male and female groups ($P = 0.30$, $\chi^2 = 16.15$). Furthermore, the most common injuries were ligament rupture and chronic tendon injury, respectively. The rate of the ligament rupture was respectively 19.12% and 31.25% among the female and male judokas, and the tendon injury rate was 19.12% and 11.60% in women and men, but there was no significant difference between men and women ($P = 0.10$, $\chi^2 = 20.9$).

The results on the most common mechanisms of sports injuries in the male and female judokas of national teams also suggested that the most common mechanisms of sports injuries in female judokas were high traction and receiving blows from the opposing player and there was no significant difference in terms of gender ($P = 0.24$, $\chi^2 = 4.57$). The health and demographic information of the participants are presented in table 1.

Table 1. Health and demographic information by gender in judokas of Iranian national teams

Study variable (unit of measurement)	Women	Men	Total	P (Difference between women and men)	
Individuals surveyed	46 (47.42)	51 (52.58)	97 (100)	-	
Injured people	42 (45.16)	51 (54.84)	93 (100)		
Injury	68 (37.78)	112 (62.22)	180 (100)	-	
Injury based on severity	Mild	3 (4.41)	13 (11.61)	16 (8.89)	0.10
	Moderate	36 (58.29)	70 (62.50)	106 (58.89)	
	Severe	29 (46.95)	29 (25.89)	58 (32.22)	
Injury area	Knee	11 (16.18)	30 (26.78)	41 (22.78)	0.30
	Shoulder	19 (27.94)	15 (13.39)	34 (18.89)	
	Finger	7 (10.29)	20 (17.86)	27 (15.00)	
	Spine	7 (10.29)	6 (5.35)	13 (7.22)	
	Ankle	7 (10.29)	6 (5.35)	13 (7.22)	
	Elbow	2 (2.94)	8 (7.14)	10 (5.56)	
	Thigh	2 (2.94)	8 (7.14)	10 (5.56)	
	Wrist	6 (8.82)	2 (1.79)	8 (4.44)	
	Leg	3 (4.41)	3 (2.68)	6 (3.33)	
	Forearm	2 (2.94)	2 (1.79)	4 (2.22)	
	Chest	2 (2.94)	2 (1.79)	4 (2.22)	
	Face	-	4 (3.57)	4 (2.22)	
	Pelvis	-	2 (1.79)	2 (1.11)	
	Ear	-	2 (1.79)	2 (1.11)	
	Nose	-	2 (1.79)	2 (1.11)	
Type of injury	Ligament rupture	13 (19.12)	35 (31.25)	48 (26.67)	0.10
	Chronic tendon injury	13 (19.12)	13 (11.60)	26 (14.45)	
	Bone fracture	11 (16.18)	8 (7.14)	19 (10.56)	
	Inflammation/swelling	7 (10.29)	8 (7.14)	15 (8.33)	
	Joint dislocation	2 (2.94)	11 (9.82)	13 (7.22)	
	Muscle rupture	2 (2.94)	11 (9.82)	13 (7.22)	
	Bruising	2 (2.94)	9 (8.04)	11 (6.11)	
	Meniscus injuries	5 (7.35)	4 (3.57)	9 (5.00)	
	Respiratory problems	5 (7.35)	2 (1.79)	7 (3.89)	
	Nerve/spinal cord injuries	-	7 (6.25)	7 (3.89)	
	Muscle spasm/cramp	4 (5.88)	-	4 (2.22)	
	Chronic muscle injury	2 (2.94)	-	2 (1.11)	
	Cartilage injuries	2 (2.94)	-	2 (1.11)	
	Scratch/wear	-	2 (1.79)	2 (1.11)	
	Open wound/rupture/cut	-	2 (1.79)	2 (1.11)	
Mechanism of injury	Blows received from the opponent	16 (23.53)	56 (50.00)	72 (40.00)	0.24
	High traction	24 (35.29)	22 (19.64)	46 (25.56)	
	Falling on the surface	14 (20.59)	11 (9.82)	25 (13.88)	
	High repetitions of a movement	5 (7.35)	11 (9.82)	16 (8.89)	
	Contact with fixed objects	2 (2.94)	8 (7.14)	10 (5.56)	
	Falling from a height or landing badly	5 (7.35)	4 (3.57)	9 (5.00)	
	Hitting the opposing player	2 (2.94)	-	2 (1.11)	

Data are reported as n (%).

Discussion

The aim of this study was to investigate the sports injuries in male and female judokas of Iranian national teams. The results revealed that the incidence of injuries in all judokas was 46.39 injuries per 1000 athletes and by gender, this rate was 54.90 and 36.95 injuries per 1000 athletes in men and women, respectively.

The results were consistent with the findings of a study by Green et al. conducted to investigate sports injuries at the University of Sheffield International Competition, in which the incidence of injuries in women was reported to be 40.9 per 1,000 athletes (12). However, in another study, the total number of injuries reported during competitions under the age of 23 in Europe was 35.6 per 1000 athletes (5), which is less than the total number of injuries reported in the present study, and the probable reason could be the younger age of judokas, the claim which needs further investigations.

The knee, shoulder, and finger joints were the most common areas of injury among male and female national team judokas, consistent with previous studies (13). Previous studies have reported that in the sport of judo, the lower limbs are more vulnerable than the upper limbs (14), which is consistent with the findings of the present study among male judokas. One of the possible reasons for the greater vulnerability of the lower limbs in male judokas of the Iranian national teams is the high use of foot techniques in them compared to foreign judokas. Iranian male judokas are more influenced by the techniques used in wrestling or Chukhe (14).

In the present study, it was found that ligament and tendon injuries were the most common types of sports injuries among male and female athletes of national judo teams, with significant differences in terms of gender. The results in line with the findings of the present study in this field include the studies of Carvalho (15), Blach et al. (13), and Pocecco et al. (6). They reported the most common injuries in judokas being ligament injuries (6,13,15) and tendon injuries (6,15). The use of the throwing techniques and the opponent falling on the athlete during the landing are one of the common mechanisms in ligament and strain injuries (16). Other mechanisms of sprain and strain injuries among judokas include techniques that lead to movements in the full range of motion (ROM) of the joint. On the other hand, judo requires muscle strength to perform the techniques, and insufficient power to perform judo techniques properly due to fatigue leads to joint and muscle injuries (17).

The results of the present study in determining the severity of the type of injury showed that most of the injuries in men and women judokas in the Iranian national teams were moderate injuries; so that these injuries resulted in the athlete staying away from the sports fields for 8 to 21 days. In this regard, Linek et al. reported the highest severity of injuries in judokas of moderate type (18). It is important to note that a professional or beginner level also influences the severity of the reported injuries; So that in novice athletes, the most common type of injury is mild, but in professional and championship athletes, the highest severity of injury is moderate (14). In the study by Moqaddasi et al., mild injuries were more common (19), which may be due to the unprofessional level of the athletes.

The ultimate goal of the present study was to determine the most common mechanism of sports injuries in male and female judokas of Iranian national judo teams. In the men, the most common mechanism of injury was a blow from the opponent player, and in the women, high traction by the opponent. An estimate of 6.5 million participants in the martial arts of judo and taekwondo showed that falling due to an opponent's blow is the most common mechanism of injury in the sport (2), which is somewhat consistent with the results of the present study. Wrong application of throwing techniques by the opponent and weakness in correct falling techniques can cause many injuries to the judoka (2). Research results have reported that falling due to an opponent's blow, especially in the Seoi nage throw technique, can lead to serious neck injuries (20).

Limitations

One of the most important limitations in the present study was the use of a questionnaire that some participants may have refused to provide a real answer or a large number of items in the questionnaire may affect the accuracy of their answers. Other limitations of the study included the small sample size. Due to the limited number of athletes in the field at a competitive level, the goal was unavoidable, and because of this, it was not possible to examine injuries at different ages or in more precise subgroups.

Recommendations

Due to the limitation of the questionnaire in the accuracy of data collection, the interview method is recommended to be used and also, the injuries in this field at other beginner and semi-professional levels be examined and compared. It is better to consider a

larger sample size in the future studies with more complete and accurate information to design an exercise program appropriate to the gender and skill level to prevent injury. Additionally, due to the high prevalence of ligament injuries in the knees and shoulders of athletes in this field, it seems necessary to take measures in the design of exercises to reduce the rate of such injuries to a minimum.

Conclusion

The results of the present study suggested that the joints of the knee, shoulder, and fingers were the most common areas of sports injury in men and women judokas of the Iranian national teams. Moreover, the tendon and ligament injuries are the most common types of sports injuries in judo; while no significant difference was observed between men and women. Most of the injuries were of the moderate type. From the injury mechanism point of view, receiving blows from the opposing player and high traction were reported as the most common injury mechanisms. The information obtained from the present study can be effective in strategies and programs to prevent various judo injuries for coaches, athletes, and medical staff of teams.

Acknowledgments

The present study was extracted from an MSc thesis on Sport Injury and Corrective Exercises with the code 162283223, approved by the Isfahan (Khorasgan) Branch, Islamic Azad University. The authors would like to appreciate the Judo Federation of the Islamic Republic of Iran for their cooperation in conducting this study. The esteemed coaches and athletes of the national judo teams who assisted in the implementation of this research project are also appreciated.

Authors' Contribution

Vahid Bana: attracting financial resources for the study, study support, executive, and scientific

services, providing study equipment and samples, data collection, analysis and interpretation of results, manuscript preparation, specialized evaluation of the manuscript in terms of scientific concepts, approval of the final manuscript to be submitted to the journal office, responsibility to maintain the integrity of the study process from the beginning to the publication, and responding to the referees' comments; Rezvan Mirsafaei-Rizi: study design and ideation, study support, executive, and scientific services, analysis and interpretation of results, specialized statistics services, manuscript preparation, specialized evaluation of the manuscript in terms of scientific concepts, approval of the final manuscript to be submitted to the journal office, responsibility to maintain the integrity of the study process from the beginning to the publication, and responding to the referees' comments.

Funding

The present study was conducted based on the secondary analysis of part of the information extracted from an MSc thesis in Sport Injury and Corrective Exercises with the code 162283223 and the ethics code IR.IAU.KHUISF.REC.1399.039, without financial support from a specific resource. The Isfahan (Khorasgan) Branch, Islamic Azad University did not comment on data collection, analysis, and reporting, manuscript preparation, and final approval of the article for publication.

Conflict of Interest

The authors declare no conflict of interest. Dr. Rezvan Mirsafaei-Rizi has been working as a faculty member at the Isfahan (Khorasgan) Branch, Islamic Azad University since 2006. Vahid Bana has been a master's degree student in Sport Injury and Corrective Exercises at the School of Physical Education and Sports Sciences, Isfahan (Khorasgan) Branch, Islamic Azad University since 2018.

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