



Original Article

Fact-finding survey regarding judo-related injuries of judokas in developing country

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Abstract. [Purpose] The purpose of this study was to investigate sports-related injuries among judokas in Mongolia which is classified in the lower-middle income country. This study may help prevent future sports-related injuries. [Participants and Methods] We studied 75 judokas affiliated to the judo club in Ulaanbaatar, Mongolia. The questionnaire survey included questions regarding current and past judo-related injuries. [Results] Out of 75 judokas, 39% judokas had current judo-related injuries, and 25% judokas had past injuries. The injuries were most commonly located in the shoulder/clavicular, followed by that in the ankle and knee. The most frequent injury was a sprain/ligament injury, followed by a fracture and a dislocation. Seventy-three percent of current injuries and 88% of the past injuries received medical attention. Self-management was carried out for 35% of the injuries. The time lost from judo matches and training was 0–1,095 days for current injuries and 0–545 days for past injuries. [Conclusion] In this study, the injury rate for judokas was higher than that reported in previous studies. In addition, numerous severe injuries were noted. It is observed that, despite medical attention and self-management, the recovery periods are prolonged. Additionally, we believe that the judokas are unable to return to competition without problems.

Key words: Sports injury, Injury prevention, Mongolia

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INTRODUCTION

Mongolia is bordered by Russia (to the north) and the People's Republic of China (to the east and south). There was a transition to democracy in the first half of the 1990's. In an economic group classification of the World Bank¹⁾, this country is classified in lower-middle income economies (countries). There are few investigations into sports injuries in developing countries, and is not investigated in Mongolia.

Judo is one of the popular sports in Mongolia. Several Mongolian judokas (judo players) have won Olympic medals since its practice began in 1960. There is an increase in the number of children who participate in judo, but unfortunately, the sports injury prevention system has not yet been developed. For examination of the injury prevention, we think that it is necessary to clarify the facts of injuries of youth judokas. The purpose of this study was to investigate sports-related injuries among judokas in Mongolia which is classified in the lower-middle income country of developing country. This study may help prevent future sports-related injuries.

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PARTICIPANTS AND METHODS

We studied 75 judokas affiliated to the judo club in Ulaanbaatar, Mongolia.

Questionnaire surveys were conducted in April 2019. The survey included items of gender, age, years of experience, and current and past judo-related injuries (Table 1). The physical therapists did the verbal questionnaire surveys. In this study, an injury was defined as “any physical injury sustained by a player that resulted from a judo match or training, irrespective of the need for medical attention or time lost from judo”. The “current injury” was defined as the injury that did not heal at the time of the investigation, and “past injury” was defined as the injury that it had been healed at the time of the investigation.

All participants were informed about the study and consent was obtained from all participants. Ethical approval was obtained from the Mongolian National University of Medical Sciences Ethics Committee (approval code 2019/3-01).

RESULTS

All of the 75 judokas, 43 were male (57%) and 32 were female (43%). Five were primary school students (7%), 27 were junior high school students (36%), 37 were high school students (49%), and 6 were college students (8%). The basic information of participants were shown in Table 2.

In total 29 judokas [39%; 13 males (30%), 16 females (50%)] had 37 current judo-related injuries (males: 16 injuries and females: 21 injuries). All of the 37 current injuries, 17 were in the upper extremities (46%), 17 were in the lower extremities (46%), 3 were in the trunk (8%). The injuries were mostly located in the shoulder/clavicular, followed by the ankle and knee (Table 3). The current injuries were classified as 32 traumatic injuries (86%) and 5 overuse injuries (14%). Sprain/ligament injury was the most frequent injury, followed by fracture/bone injury and then dislocation (Table 3). The most common situations that caused the current injuries were throwing techniques (Table 3). Based on time of progression, 19 injuries were sustained <1 year ago (51%) and 18 were sustained >1 year ago (49%), and onset time of injuries was old as the high generation (Table 4). Twenty-seven injuries received medical attention [73%; males: 12 injuries (75%) and females: 15 injuries (70%)]. Time lost from judo matches and training was 65.3 ± 195.2 days (0–1,095 days; males: 29.8 ± 28.5 days and females: 92.3 ± 257.3 days), and the judoka was found to be absent from matches/training for 3 years. The recurrence was 11 injuries [30%; males: 4 injuries (25%) and females: 7 injuries (33%)]. Self-management was applied in 13 injuries [35%; males: 4 injuries (25%) and females: 9 injuries (43%)]. The self-management techniques were shown in Table 5.

Furthermore, 19 judokas [25%; 10 males (23%), 9 females (28%)] had 25 past judo-related injuries (males: 12 injuries and females: 13 injuries). Past injuries were not found in primary school students. All of the 25 past injuries, 12 were in the upper extremities (48%), 9 were in the lower extremities (36%), 3 were in the trunk (12%), and 1 was in the head/face (4%). The injuries were mostly located in the ankle, followed by the shoulder/clavicular and forearm (Table 6). Past injuries were classified as 21 traumatic injuries (84%) and 3 overuse injuries (12%). Sprain/ligament injury was the most frequent injury, followed by fracture and dislocation (Table 6). Twenty-two injuries received medical attention [88%; males: 10 injuries

Table 1. Survey items

Question Items	Selection items
1. Basic information	1) Gender, 2) Age, 3) Years of experience
2. Judo-related current injuries	1) Existence of current injury, 2) Injury name, 3) Location, 4) Onset time, 5) Situation caused by injury, 6) Medical attention, 7) Time lost from judo, 8) Recurrence, 9) Self-management techniques
3. Judo-related past injuries	1) Existence of past injury, 2) Injury name, 3) Location, 4) Onset time, 5) Situation caused by injury, 6) Medical attention, 7) Time lost from judo

Table 2. Basic information of participants

	Total	Gender		Generation			
		Male	Female	Primary school	Junior high school	High school	College
Age (years) : average	14.5 ± 2.5	14.3 ± 1.5	14.7 ± 3.4	10.2 ± 0.8	13.2 ± 1.2	15.1 ± 1.2	20.2 ± 2.1
(range)	(9–22)	(11–19)	(9–22)	(9–11)	(11–15)	(13–18)	(17–22)
Height (cm)	157.4 ± 11.7	159.4 ± 11.4	154.8 ± 11.8	140.0 ± 9.8	154.2 ± 12.6	161.2 ± 9.1	163.2 ± 3.9
Body weight (kg)	53.0 ± 11.8	54.2 ± 11.2	51.4 ± 12.5	40.2 ± 11.7	49.9 ± 9.9	55.2 ± 11.5	64.2 ± 8.4
Years of experience (years)	2.9 ± 2.6	2.9 ± 2.4	2.9 ± 2.8	1.4 ± 0.9	2.4 ± 2.2	2.9 ± 2.1	6.8 ± 4.3

Table 3. Location, type and situation that caused the current injuries

	Total	Gender		Generation			
		Male	Female	Primary school	Junior high school	High school	College
Location of current injuries (cases)							
Shoulder/Clavicula	9 (24%)	3	6	0	3	2	4
Ankle	7 (19%)	2	5	1	0	5	1
Knee	5 (14%)	2	3	0	0	3	2
Forearm	4 (11%)	1	3	0	1	3	0
Low back (low trunk)	2 (5%)	2	0	0	1	1	0
Elbow	2 (5%)	1	1	0	0	2	0
Toe	2 (5%)	1	1	0	0	1	1
Others	6 (16%)	4	2	0	1	5	0
Total	37 (100%)	16	21	1	6	22	8
Types of current injuries (cases)							
Sprain/Ligament injury	15 (41%)	5	10	1	1	8	5
Fracture/Bone injury	8 (22%)	3	5	0	1	6	1
Dislocation	7 (19%)	3	4	0	1	5	1
Pain	3 (8%)	1	2	0	2	0	1
Others	4 (11%)	4	0	0	1	3	0
Total	37 (100%)	16	21	1	6	22	8
Situation that caused the current injuries (cases)							
Throwing techniques	21 (57%)	10	11	1	1	16	3
Grappling techniques	4 (11%)	1	3	0	0	1	3
Fall down	3 (8%)	2	1	0	3	0	0
Collision with partner	2 (5%)	0	2	0	2	0	0
Others	7 (19%)	3	4	0	0	5	2
Total	37 (100%)	16	21	1	6	22	8

Table 4. Outset time of current injuries

	Total	Gender		Generation			
		Male	Female	Primary school	Junior high school	High school	College
Within 1 month	4 (11%)	2	2	1	1	1	1
1 to 3 months	5 (14%)	3	2	0	1	3	1
3 to 6 months	2 (5%)	2	0	0	0	2	0
6 months to 1 year	8 (22%)	2	6	0	1	7	0
1 to 2 years	10 (27%)	5	5	0	3	6	1
More than 2 years	8 (22%)	2	6	0	0	3	5
Total	37 (100%)	16	21	1	6	22	8

Table 5. Self-management techniques (multiple answers)

	Total	Gender		Generation			
		Male	Female	Primary school	Junior high school	High school	College
Massage	4 (25%)	3	1	0	0	3	1
Home exercise	3 (19%)	2	1	0	0	2	1
Taping	2 (13%)	0	2	0	0	1	1
Medical drug	2 (13%)	0	2	1	1	0	0
Others	5 (31%)	1	4	0	1	3	1
Total	16 (100%)	6	10	1	2	9	4

Table 6. Location, type and situation that caused the past injuries

	Total	Gender		Generation		
		Male	Female	Junior high school	High school	College
Location of past injuries (cases)						
Ankle	5 (20%)	2	3	0	5	0
Shoulder/Clavicula	4 (16%)	1	3	0	1	3
Forearm	4 (16%)	1	3	1	3	0
Low back (low trunk)	2 (8%)	1	1	0	1	1
Wrist	2 (8%)	1	1	0	1	1
Knee	2 (8%)	0	2	0	0	2
Others	6 (24%)	6	0	1	5	0
Total	25 (100%)	12	13	2	16	7
Types of past injuries (cases)						
Sprain/Ligament injury	8 (32%)	4	4	1	4	3
Fracture	6 (24%)	3	3	1	5	0
Dislocation	5 (20%)	2	3	0	4	1
Lumber vertebrae herniated disk	2 (8%)	1	1	0	1	1
Others	4 (16%)	2	2	0	2	2
Total	25 (100%)	12	13	2	16	7
Situation that caused the past injuries (cases)						
Throwing techniques	16 (64%)	9	7	0	13	3
Fall down	2 (8%)	1	1	2	0	0
Turn	2 (8%)	0	2	0	0	2
Grappling techniques	1 (4%)	0	1	0	0	1
Others	4 (16%)	2	2	0	3	1
Total	25 (100%)	12	13	2	16	7

(83%) and females, 12 injuries (92%)]. Time lost from judo matches and training was 47.6 ± 108.7 days (0–545 days; males: 34.8 ± 30.7 days and females: 60.5 ± 153.0 days), and the judoka was found to be absent from matches/training for approximately 1.5 years.

DISCUSSION

In the present study, 39% judokas had current judo-related injuries in Mongolia. Soligard et al.²⁾ reported that injury data from the 2016 Summer Olympic Games (SOG) in Rio de Janeiro revealed approximately 10% judo injury risk, while Engebretsen et al.³⁾ reported that the judo injury risk was 12.3% per the injury data from 2012 SOG in London. Furthermore, Green et al.⁴⁾ reported that 13.5% judokas had injuries per the questionnaire survey results of 3 competitions. The injury ratio of judokas in this study was higher than that reported in previous studies, possibly because many previous studies had investigated the injuries that occurred during the match and reported different competition levels and player age groups. In this study, an injury was defined as “any physical injury sustained by a player that resulted from a judo match or training”. We did not prescribe any medical attention or consider time lost from judo matches/training. In addition, we investigated minimal injuries too. Therefore, we believe that the injury ratio was possibly high in this study.

Regarding the location of the judo-related injury, Pocecco et al.⁵⁾ reported that judo injuries mostly affect the extremities, especially the knees (up to 28%), shoulders (up to 22%), and hands/fingers (up to 30%), although ankle injuries comprise of 3.7–14.0% injuries. In this study, injuries were mostly found on the shoulder/clavicular (24%), followed by the ankle (19%) and knee (14%). The injury rates for shoulder/clavicular and knee were similar to those reported in previous studies. However, the injury ratio of the ankles was higher than that reported in previous studies. Furthermore, the injury ratio of the hands/fingers was lower than that reported in previous studies (6%). Regarding the type of judo-related injuries, Pocecco et al.⁵⁾ further reported that the most frequent injury types were sprains (5.6–59.8%), strains (7–33.8%), and contusions (5.6–59.8%). Moreover, Frey et al.⁶⁾ reported that the most frequent judo-related traumatic injury types during 21 seasons of competitions in France were sprains (54.3%), followed by fractures (15.6%) and dislocations (12.5%). In this study, the most frequent types of injuries were sprains/ligament injuries, followed by fractures and dislocations. Our results were similar to those reported by Frey et al.⁶⁾, and many severe injuries, including fractures and dislocations, have been reported

in Mongolia. In addition, injuries that had occurred >1 year ago account for half of the injuries in this study, and we believed that severe injuries may have been prolonged. Furthermore, there were no contusions in this research. Therefore, contusion might not be identified as an injury.

In this study, the most frequent situation that caused injuries was throwing techniques. Pocecco et al.⁵⁾ reported that nearly 85% of judo-related injuries occurred during a standing fight than during a ground fight. The classification methods used in their study were different, but this investigation had similar results. A judoka must grip his/her opponent before attacking, and more time is spent in stand-up fighting than in ground fighting⁴⁾. Therefore, in this study, the situation that caused injuries included many throwing techniques, which include stand-up fighting.

In this study, 73% and 88% current and past injuries, respectively received medical attention. In addition, self-management (such as massage and home exercise) was implemented in 35% injuries. However, injuries that occurred >1 year ago accounted for 50%. As the high generation, the time of progression of injuries were tended to long-term. Furthermore, time lost from judo matches and training was 65.3 ± 195.2 days (0–1,095 days); there was an experienced judoka who was out of competitions for 3 years. The injuries are prolonged even if judokas receive medical attention or provide self-management, and it is believed that judokas are unable to return to competition without problems. In the low generation, we plan the early improvement of the injuries and prevent prolongation. Therefore, we think that the injury rate in high generation may decrease. Moreover, we believe that it is important to plan the spread of sports injury prevention programs from low generation in Mongolia as future issue.

The health care system in Mongolia was based on the medical education system of the Union of Soviet Socialist Republics during the socialist era. At that time, nurses and physical coaches were carrying out all rehabilitation work. However, education of physical therapy was started in 2007, and the first physical therapists have begun to work in 2011. There were 147 physical therapists as of December 2018⁷⁾. They practice medical rehabilitation at medical institutions, mainly hospitals. We believe that it is necessary to educate physical therapists in charge of athletic rehabilitation in Mongolia to prevent prolonged injuries and to smooth return to competition in the future.

Conflicts of interest

None.

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