

Injury prevention in Paralympic Judokas

By Dr. Mohammadreza Mahmoudkhani
Sport Injury Prevention Specialist

Hi, I'm Mohammadreza Mahmoudkhani

- ❖ PhD of Sport Injuries and Corrective Exercises
- ❖ Judo Coach. 4 Dan
- ❖ Head of National Paralympic Academy of Iran



What we are talking today?

- Epidemiology of injury in Para judo
- Injury rate in Para Judo
- Injury risk factors
- injury prevention Strategies
- Preventive training Protocols

- Around 253 million people worldwide are visually impaired
- 36 million are blind
- Interest in the sport is steadily growing, with increasing numbers of partially sighted and blind athletes participating each year.

Participation in sports is, however, not without risk.

*Whilst mainstream judo is an established combat sport, Paralympic judo is a much younger sporting discipline.

*Paralympic judokas are classified into three vision classes (B1, B2, B3) depending upon their visual impairment.

* Data from judo in able-bodied athletes has shown that these athletes are prone to a range of injuries.

Paralympic athletes suffer from more injuries compared to their Olympic counterparts, and this is especially pertinent in VI sport.

- * Few studies have assessed the specific injury burden in Paralympic judo, which is a barrier to injury prevention program.

Paralympic sports with the highest risk of injury

High Risk Sport	Low Risk Sport
Para Cycling	Para Archery
Equestrian	Para Athletic
Judo	Boccia
Soccer	wheelchair Fencing
Wheelchair basketball	Goal Ball
Wheelchair Rugby	Para Power lifting
	Para Shooting
	Para Swimming
	Para Table tennis



Injury rate by sport -London 2012

Table 2 The incidence rate (IR) of injury in each sport and percentage of athletes injured in each sport in the total period

Sport	N (per sport)	Total number of athletes competing (per sport)	Total number of athlete exposure days (per sport)	Per cent (per sport)	IR (95% CI)
Football 5-a-side	22	70	980	31.4	22.4 (14.1 to 33.8)
Powerlifting	44	163	2282	27.0	19.3 (14.0 to 25.8)
Goalball	30	110	1540	27.3	19.5 (13.2 to 27.7)
Wheelchair fencing	24	95	1330	25.3	18.0 (11.6 to 26.7)
Wheelchair rugby	18	79	1106	22.8	16.3 (9.7 to 25.6)
Athletics	216	977	13678	22.1	15.8 (13.8 to 18.0)
Judo	25	115	1610	21.7	15.5 (10.1 to 22.8)

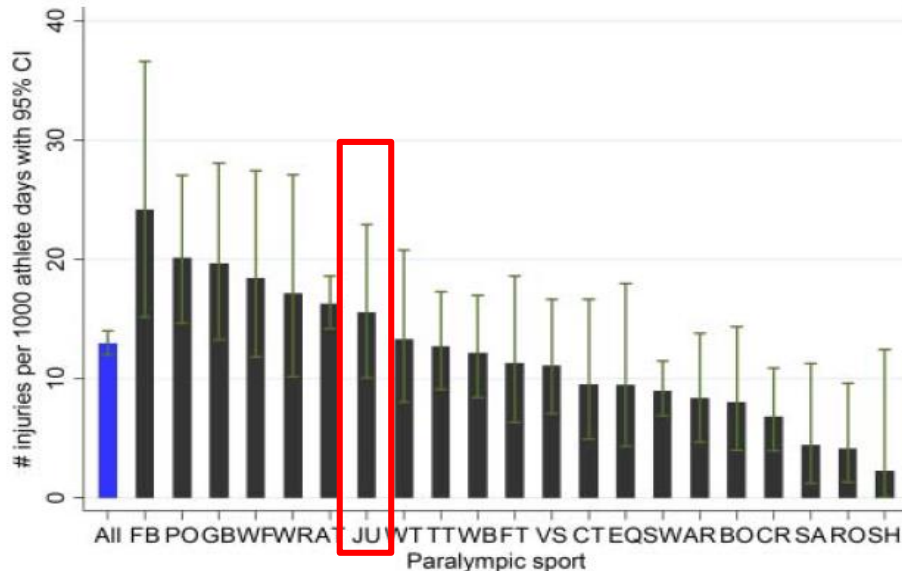


Figure 1 Sport-specific injury rates (injuries/1000 athlete-days).

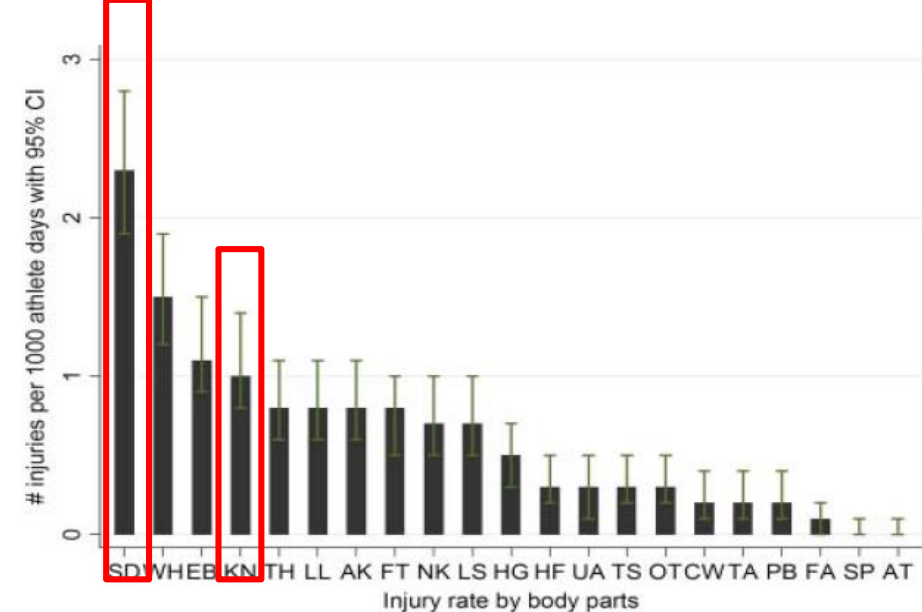


Figure 2 Injury rates (injuries/1000 athlete-days) by anatomical region.

Injury rate by sport -Rio de Janeiro 2016

Table 4 Incidence of injury by sport for athletes competing at the Rio 2016 Summer Paralympic Games in descending order of injury incidence rate

Sport	Total number of injuries (percentage of total number of injuries)	Number of athletes with an injury	Total number of athletes competing	Total number of athlete days	Proportion of athletes with an injury	Injury incidence rate: number of injuries/1000 athlete days (95% CI)
All	510 (100%)	441	3657	51 198	12.1	10.0 (9.1 to 10.9)
Football 5-a-side	22 (4.3%)	17	70	980	24.3	22.5 (14.8 to 34.1)*
Wheelchair fencing	16 (3.1%)	13	72	1008	18.1	15.9 (9.7 to 25.9)
Judo	25 (4.9%)	19	115	1610	16.5	15.5 (10.5 to 23.0)*

Table 5 Incidence of sport-related injury by each anatomical area for athletes competing at the Rio 2016 Summer Paralympic Games

Anatomical area	Total number of injuries (percentage of total number of injuries)	Number of athletes with an injury	Proportion of athletes with an injury (%)	Injury incidence rate: number of injuries/1000 athlete days (95% CI)
All	440 (100%)	382	10.4	8.6 (7.8 to 9.4)
Head and face	7 (1.6%)	7	0.2	0.1 (0.1 to 0.3)
Neck	37 (8.4%)	36	1.0	0.7 (0.5 to 1.0)
Shoulder	90 (20.5%)	84	2.3	1.8 (1.4 to 2.2)

Table 2 The incidence rate (IR) of injury in each sport and percentage of athletes injured in each sport in the total period

Sport	N (per sport)	Total number of athletes competing (per sport)	Total number of athlete exposure days (per sport)	Per cent (per sport)	IR (95% CI)
Football 5-a-side	22	70	980	31.4	22.4 (14.1 to 33.8)
Powerlifting	44	163	2282	27.0	19.3 (14.0 to 25.8)
Goalball	30	110	1540	27.3	19.5 (13.2 to 27.7)
Wheelchair fencing	24	95	1330	25.3	18.0 (11.6 to 26.7)
Wheelchair rugby	18	79	1106	22.8	16.3 (9.7 to 25.6)
Athletics	216	977	13678	22.1	15.8 (13.8 to 18.0)
Judo	25	115	1610	21.7	15.5 (10.1 to 22.8)

Injury rate by sport - London 2012 VS Rio de Janeiro 2016

Table 4 Incidence of injury by sport for athletes competing at the Rio 2016 Summer Paralympic Games in descending order of injury incidence rate

Sport	Total number of injuries (percentage of total number of injuries)	Number of athletes with an injury	Total number of athletes competing	Total number of athlete days	Proportion of athletes with an injury	Injury incidence rate: number of injuries/1000 athlete days (95% CI)
All	510 (100%)	441	3657	51 198	12.1	10.0 (9.1 to 10.9)
Football 5-a-side	22 (4.3%)	17	70	980	24.3	22.5 (14.8 to 34.1)*
Wheelchair fencing	16 (3.1%)	13	72	1008	18.1	15.9 (9.7 to 25.9)
Judo	25 (4.9%)	19	115	1610	16.5	15.5 (10.5 to 23.0)*

Participant demographics, 1-year prevalence of sports-related injuries and proportion of injured athletes.

	Total number of athletes (n) and (%) of all	Injury prevalence, n (%; 95% CI)	Injured athletes (% of all athletes in the study)
All	45 (100%)	38, (84%; 71–93)	84%
Female	14 (31%)	9 (64%; 39–84)	20%
Male	31 (69%)	29 (93%; 77–100)*	64%
Age group			
18–23	15 (33%)	12 (80%; 53–94)	27%
24–29	10 (22%)	10 (100%; 65–100)	22%
30–35	15 (33%)	12 (80%; 53–94)	27%
36–41	6 (9%)	3 (50%; 19–81)	7%
42+	1 (2%)	1 (100%; 16–100)	2%
Vision class			
B1	14 (31%)	9 (64%; 39–84)	20%
B2	19 (42%)	18 (95%; 72–100)	40%
B3	12 (27%)	11 (92%; 61–100)	24%
Weight category			
Low weight**	23 (51%)	19 (42%; 29–57)	42%
–48 kg (w)	2 (4%)	1 (50%; 10–91)	2%
–52 kg (w)	6 (13%)	4 (67%; 29–91)	9%
–57 kg (w)	1 (2%)	1 (100%; 16–100)	2%
–60 kg (m)	8 (18%)	8 (100%; 60–100)	18%
–63 kg (w)	1 (2%)	1 (100%; 16–100)	2%
–66 kg (m)	4 (9%)	3 (75%; 28–97)	7%
Heavy weight***	22 (49%)	19 (42%; 29–57)	42%
–70 kg (w)	2 (4%)	1 (50%; 10–91)	2%
+70 kg (w)	2 (4%)	0 (0%; 0–73)	0%
–73 kg (m)	3 (7%)	3 (100%; 36–100)	7%
–81 kg (m)	2 (4%)	2 (100%; 27–100)	4%
–90 kg (m)	7 (16%)	6 (86%; 45–100)	13%
–100 kg (m)	6 (13%)	6 (100%; 53–100)	13%
+100 kg (m)	1 (2%)	1 (100%; 16–100)	2%

The breakdown of sport by onset of injury in London 2012 Paralympic Games

Table 4 Number and onset of injuries by sport, as a proportion (%) of all injuries incurred in each sport

Sport	Number of injuries	Percentage of acute injuries	Percentage of acute or chronic injuries	Percentage of overuse injuries
Football 5-a-side	22	54	23	23
Powerlifting	44	14	25	61
Goalball	30	77	10	13
Wheelchair fencing	24	42	0	58
Wheelchair rugby	18	61	22	17
Athletics	216	50	21	29
Judo	25	64	16	20

Location and type of injury

The most injured body location in Paralympic Judokas

- shoulder girdle
- knee/lower leg



sprains, strains and ruptures

The most common injury types in Paralympic JudoKas.

preventive strategies

To prevent traumatic injuries in these joints, which commonly lead to long-term consequences such as osteoarthritis, it has been recommended to improve falling skills and athletes' levels of strength and flexibility.



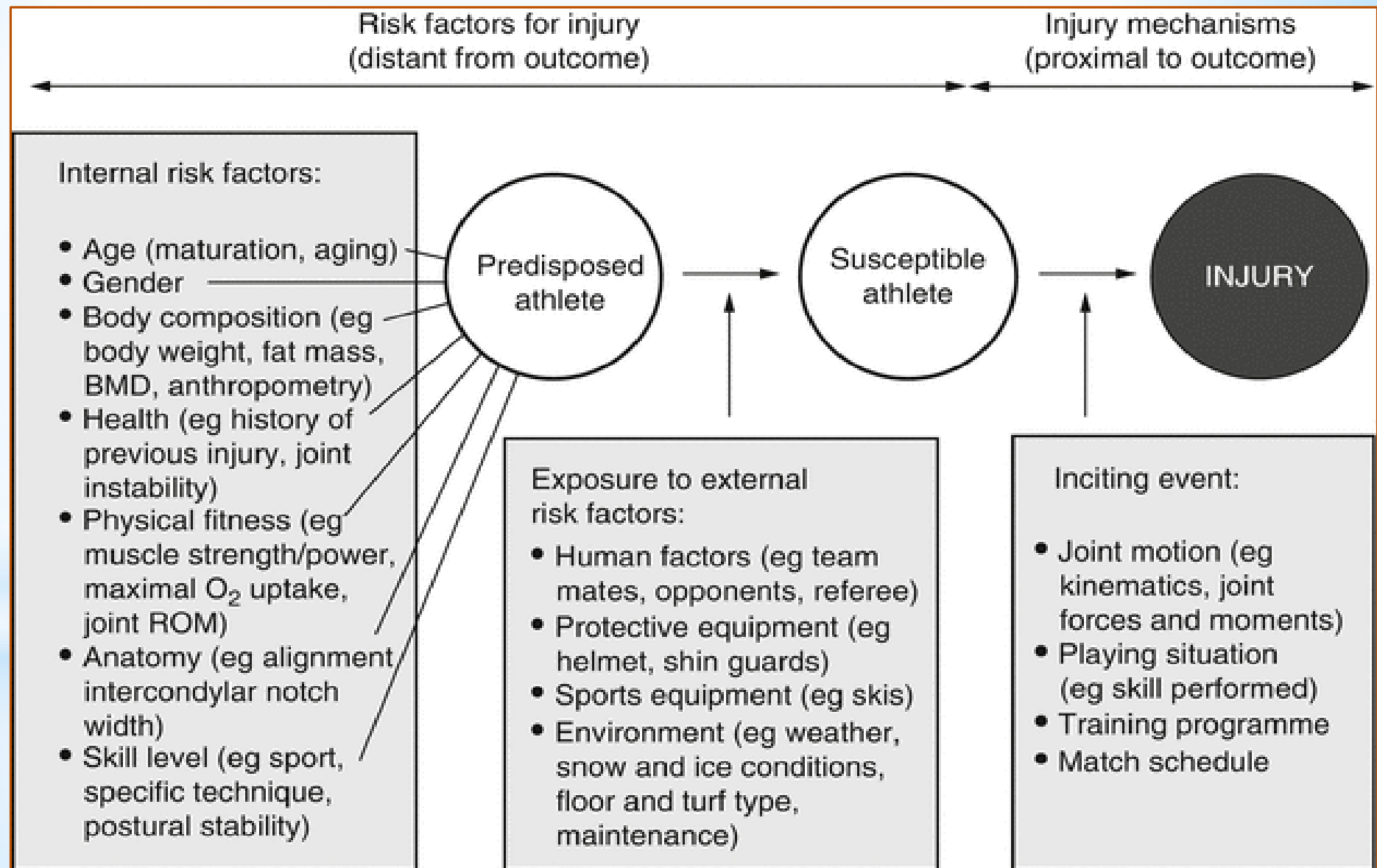
Some specific features of judo injury

Most injuries occur during training (in tachi waza)

To prevent traumatic injuries,

- * minimize time in tachi waza,
- * ensure appropriate safety and medical support when practicing in tachi waza.
- * allow matches continue into ne wasa more easily.

Injury Risk Factors



*Some Specific Injury Risk Factors in Paralympic Judokas

- *lower levels of muscle power performance in compared with Olympic judokas.
- *impaired postural balance,
- *blind judokas suffering from performance disadvantages when competing with sighted or partially sighted athletes.

Recommendations To Reduce The Number And Severity Of Injuries In Paralympic Judo Competition

Adapting Paralympic athletes with:

- Warm up and recovery
- Improve sports performance
- Appropriate body weight control
- Adequate training load planning
- protective equipment
- medical issues
- Creating a psychological and biomechanical profile of each athlete with their specific impairments
- Monitoring and self-report athlete



Improve sports performance

- Significant Aerobic Capacity
- Peak Of Anaerobic Power
- Explosive Strength
- Proprioception
- Joint Mobility
- Athletic Training
- Muscular Strength
- Flexibility
- Speed And Agility
- Core Strength Training
- Neuromuscular Control And Balance
- Muscle Symmetries



Injury patterns related to the athletes impairments

- Improved muscular balance between dominant and non-dominant leg and Arm for injury prevention
- The ratio of the knee extensors to the flexors at each side and Shoulder external rotator and internal rotator
- Cross training
- Improper biomechanical load in training because of repetitive movement
- Improving intramuscular and intermuscular coordination

Introducing injury prevention program

1. warm up protocol

2. technical training protocol

The IPPON intervention (warm up protocol)

aimed to prevent and/or reduce the occurrence of shoulder, knee and ankle injuries among judo athletes.

The trainer-based intervention consists of 36 exercises classified into three categories:

- (1) flexibility and agility,
- (2) balance and coordination
- (3) strength and stability.

The program should be performed minimal two times per week at the start of the judo training.



Warm-up programme



FLEXIBILITY & AGILITY

Choose 4 exercises



JUDO PUSH-UP **

Wide-legged position. Make a head roll backwards. Place both hands on the tatami. Circulate the upper body.



POWER WORM **

Walk with the hands on the tatami as far as possible. Legs are stretched out. Walk with the feet to the hands.



SPIDERMAN ***

Start in push-up position. Horizontal walk with the right knee to the right elbow, then the left knee to the left elbow.



3-STEP HANDSTAND *

Place both hands on the tatami. Try to move in vertical position in 3 steps. Use more

BALANCE & COORDINATION

Choose 4 exercises



WAVE JUMP*

Place the feet on the tatami. Jump forwards with 2 feet, then jump forwards with 1 foot while the other leg is curved. Switch.



CROSS JUMP *

Place the feet on the tatami. Jump forwards and cross both feet. First the right foot in front of the left foot, then switch feet.



O-UCHI-HOP**

Place the left foot on the tatami. Stretched out both arms. Circulate clockwise with the right foot. Jump forwards with the left leg.



SODE TWIST *

Choose a partner. Hold the sleeves crossed. Step 3 times sideways. Turn 360 degrees on

STRENGTH & STABILITY

Choose 4 exercises



WHEELBARROW WALK**

Choose a partner. Wheelbarrow position. Walk 3 steps forwards. The partner let loose one leg for 3 seconds. Stay horizontal!



WHEELBARROW PUSH **

Choose a partner. Wheelbarrow position. Walk 3 steps forwards. 1 push-up with both elbows backwards.



PIKE PUSH **

Squat position. Place both hands on the tatami. Move head and shoulders up and down towards the tatami. Make a head roll.



TAP GAME *

Choose a partner. Start in push-up position. Try to tap the back of each others hand. It is

“Multi-Segmental, Single Leg, Standing Technics” (MSSLSTs)

Technical Intervention

The following mandatory frameworks were considered for the design of training intervention:

1. Training in both gripping style (left and right)
2. performing tachi waza's techniques in a static and dynamic situation with taisabaki
3. Practicing technique, without lifting the opponent from the ground
4. Practicing technique along with an opponent's controlled picking-without throwing
5. Performing nage waza
6. Practicing technique in Ne Waza
7. Practicing Randori's

MSSLSTs Intervention

Exercise status	Techniques names	Total repetitions of each technique * per training session			
		Weeks 1-2	Weeks 3-4	Weeks 5-6	Weeks 7-8
Dynamic (with Taisabaki)	Combined** Without Lifting opponent	40	44	54	60
	Combined with lifting opponent	20	22	26	30
	Combined Technique*** (Without Lifting opponent)	20	22	26	40
	Technique (With Lifting opponent)	10	13	14	16
Static (without Taisabaki)	Combined without Lifting opponent	60	66	80	90
	Combined with Lifting opponent	30	34	40	44
	Technique without Lifting opponent	20	22	26	30
	Technique with Lifting opponent	10	12	14	16
Throwing the opponent /dynamic or static		10	11	13	14
Fights (two opponents)		3 rounds (3 minutes)	3 rounds (3.30 minutes)	3 rounds (4 minutes)	3 rounds (4.30 minutes)
Seated training		5 minutes	5.30 minutes	6.30 minutes	7 minutes
Cooling off		10 minute			

* The development of these judo-specific injury prevention (Both of them) program are the preliminary step in solving the injury problem. The effectiveness and feasibility of the final IPPON and MSSLSTs interventions on injury reduction among judo athletes should be demonstrated before wide-scale implementation.

Suggestions for more study

Journal of Science and Medicine in Sport 22 (2019) 902–906



Contents lists available at ScienceDirect

Journal of Science and Medicine in Sport

journal homepage: www.elsevier.com/locate/jsams



Original research

Prevalence of sports-related injuries in paralympic judo: An exploratory study

Kristina Fagher^{a,*}, Osman Hassan Ahmed^{b,c}, Nicolina Pernheim^d, Emma Varkey^{d,e}

^a Department of Health Sciences, Rehabilitation Medicine Research Group, Lund University, Sweden

^b Faculty of Health and Social Sciences, Bournemouth University, United Kingdom

^c The FA Centre for Disability Football Research, The Football Association, United Kingdom

^d Department of Health and Rehabilitation/Physiotherapy, The Sahlgrenska Academy, University of Gothenburg, Sweden

^e Occupational and Physiotherapy Department Östra/Sahlgrenska University Hospital, Sweden



Aspects of Sports Injuries in Athletes with Visual Impairment

LOCOMOTOR APPARATUS IN
EXERCISE AND SPORTS



ORIGINAL ARTICLE

Marília Passos Magno e Silva¹
Edison Duarte¹
Anselmo de Athayde Costa e Silva¹
Hésojy Gley Pereira Vital da Silva²
Roberto Vital³

1. Physical Education College of the State University of Campinas – Campinas, SP.
2. Medical Sciences College of the State University of Campinas– Campinas, SP.
3. Medicine College of the Federal University of Rio Grande do Norte – Natal, RN.

ABSTRACT

Most research on sport injuries in disabled athletes uses a cross-disability (physical and sensorial) design and merges different sport modalities in the same study. This procedure creates difficulties in interpreting the results, since different disabilities and modalities may cause different injury conditions. The purpose of this study was to analyze the sports injuries frequency in visually impaired athletes, to identify the site of the injury, its mechanism, and the main injuries that occur to these athletes as well as to verify if the visual class relates to the sports injury frequency. The subjects were male and female visually impaired athletes, members of the Brazilian team of athletics, soccer 5, goalball, judo, and swimming, who played in international competitions between 2004 and 2008. Data was collected using the Brazilian Paralympic Committee and the Brazilian Confederation of Sports for the Blind medical form, which included the following information: name, age, modality, competition, visual classification (B1, B2, B3), injury type, location of injury, and diagnosis. A total of 131 athletes participated in this study: 42 female, 89 male amongst which

High precompetition injury rate dominates the injury profile at the Rio 2016 Summer Paralympic Games: a prospective cohort study of 51 198 athlete days

Wayne Derman,^{1,2} Phoebe Runciman,^{1,2} Martin Schwellnus,^{2,3} Esme Jordaan,⁴ Cheri Blauwet,⁵ Nick Webborn,⁶ Jan Lexell,^{7,8,9} Peter van de Vliet,¹⁰ Yetsa Tuakli-Wosornu,¹¹ James Kissick,¹² Jaap Stomphorst¹³

The epidemiology of injuries at the London 2012 Paralympic Games

Stuart E Willick,^{1,2} Nick Webborn,³ Carolyn Emery,⁴ Cheri A Blauwet,^{1,5} Pia Pit-Grosheide,¹ Jaap Stomphorst,¹ Peter Van de Vliet,⁶ Norma Angelica Patino Marques,^{1,7} J Oriol Martinez-Ferrer,^{1,8} Esmè Jordaan,⁹ Wayne Derman,^{1,10} Martin Schwellnus¹⁰

Fagher et al. *BMC Sports Science, Medicine and Rehabilitation* (2016) 8:28
DOI 10.1186/s13102-016-0053-x

BMC Sports Science
Medicine and Rehabilitation

STUDY PROTOCOL

Open Access

The Sports-Related Injuries and Illnesses in Paralympic Sport Study (SRIIPSS): a study protocol for a prospective longitudinal study



Kristina Fagher^{1*}, Jenny Jacobsson², Toomas Timpka², Örjan Dahlström^{2,3} and Jan Lexell^{1,4,5}

Systematic development of an injury prevention programme for judo athletes: the IPPON intervention

Amber L von Gerhardt ^{1,2,3} Ingrid Vriend ^{3,4} Evert Verhagen ^{3,4}
Johannes L Tol ^{2,3} Gino M M J Kerkhoffs ^{1,2,3} Guus Reurink^{2,3}

To cite: von Gerhardt AL, Vriend I, Verhagen E, *et al*. Systematic development of an injury prevention programme for judo athletes: the IPPON intervention. *BMJ Open Sport & Exercise Medicine* 2020;0:e000791. doi:10.1136/bmjsem-2020-000791

ABSTRACT

Objectives To systematically develop an injury prevention programme in judo and test its feasibility: Injury Prevention and Performance Optimization Netherlands (IPPON) intervention.


Methods We used the five-step Knowledge Transfer Scheme (KTS) guidelines. In the first two steps, we described the injury problem in judo and showed

Summary box

What are the new findings

► A new feasible judo-specific injury prevention programme was developed to reduce and/or prevent the occurrence of musculoskeletal shoulder, knee and ankle injuries in judo using the Knowledge Transfer Scheme.

Trauma Monthly 2021;26(1):

 10.30491/TM.2021.214296.1045

Trauma
Monthly

Original Article

Effect of an Injury Prevention Program on Traumatic Factors and Athletic Performance in Judo Athletes: MSSLSTS Intervention

Mohamad Reza Mahmoudkhani ^{1*}, Abolfazl Shakibaei ², Hooman Minoonejad ³, Reza Rajabi ⁴, Amir Hossein Barati ⁵

¹ PhD in sports injury and corrective exercise, Sport Medicine and Health Department, Faculty of Physical Education and Sport Sciences, University of Tehran, Tehran, Iran

² PhD, Exercise Physiology Research Center, Lifestyle Institute, Baqiyatallah University of Medical Sciences, Tehran, Iran

³ Assistant Professor, Sport Medicine and Health Department, Faculty of Physical Education and Sport Sciences, University of Tehran, Tehran, Iran

⁴ Professor, Sport Medicine and Health Department, Faculty of Physical Education and Sport Sciences, University of Tehran, Tehran, Iran

⁵ Associate Professor, Faculty of Physical Education and Sport Sciences, Shahid Rajaee Teacher Training University, Tehran, Iran

* **Corresponding Author:** Mohamad Reza Mahmoudkhani, Sport Medicine and Health Department, Faculty of Physical Education and Sport Sciences, University of Tehran, Tehran, Iran. Email: Mahmoudkhani@ut.ac.ir

Clinics Review Articles

PHYSICAL MEDICINE AND REHABILITATION
CLINICS OF NORTH AMERICA

Para and Adapted Sports Medicine

EDITORS

Yetsa A. Tuakli-Wosornu
Wayne Derman

CONSULTING EDITOR

Santos F. Martinez

MAY 2018

Handbook of
Sports Medicine
and Science



Official Medical
Publication



The Paralympic Athlete



EDITED BY
Yves Vanlandewijck
and Walter R. Thompson

WILEY-BLACKWELL

Training and Coaching the Paralympic Athlete



EDITED BY
Yves C. Vanlandewijck
Walter R. Thompson

WILEY Blackwell

It's Q+A Time!

Have questions?
Let me know in the chat box!

Contact me:

www.linkedin.com/in/MohammadrezaMahmoudkhani
[@Mahmoudkhaniofficial](#) on Instagram
E mail: Mahmoudkhani@ut.ac.ir