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A Survey of Incidence of Injuries in Five Combat Sports in the IVth National Games - 1997

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ABSTRACT In the present study and attempt has been made to measure the frequency of injuries among 983 participants of five combat sports *viz.*, Boxing, Fencing, Judo, Tackwando and Wrestling during the IVth National Games held in Bangalore and Mysore (Karnataka state) from 31st May to 11th June, 1997. A pre-structured data proforma was used for gathering the information regarding this. A total number of 207 injuries were reported. The maximum number of injuries were reported in Boxing (39.15%) on head and face, upper limbs, lower limbs and chest and abdomen accounting mainly on skin and soft tissue injuries (50.78%). Next came Tackwando with injury frequency 31.96%, mainly on lower limbs and skin and soft tissues. In Judo, the frequency of injuries was moderate (16.95%) and very few injuries were reported in Fencing and Wrestling.

INTRODUCTION

Modern scientific age has been marked by the progress made in all areas of human endeavour in which games and sports hold a prominent place. The number of people participating in sports is ever increasing. The physical demands of different sports is also increasing and thereby the risk of injuries. It is necessary for the sports world to focus more on prevention and correct clinical care. By understanding the injury mechanisms and the risk for injury, prevention can be made effective which requires much more support from scientific studies, and for more education in injury prevention and clinical care in sports.

Blonstein (1982) reported 136 serious injuries including 3% of death in 4350 amateur boxers in various contests. Wroble and Albright (1986) uncovered several factors which put wrestlers at high risk of injuries. They reported that injury rates were much higher in competition matches than practise or training stages. Johnson (1986) made a comparative study on various injuries in sports and reported a series of 6057 consecutive sports injuries as skiing (29.45%), football (21.79%), swimming and diving (13.59%), boxing (11.49%), gymnastics (10.27%), wrestling (6.49%) and cross country runners (0.94%). Marfleet (1991) made a survey on sports injuries and reported that injuries sustained while playing ultimate six tournaments between 1986-1990 and most frequent injuries included thigh muscle strains, ankle ligament sprains, skin abarsions and friction burns. Nicholas et al. (1991) carried out a pilot study of the epidemiology of sports injuries and noted 158 incidents of injuries in 1249 participants.

The national Games are conducted at national level once in a year. It is an unique and unrivalled happening, the only sports event which unites the diverse people in a collective paroxysm, anguish, joy, glory and gain. But sometimes these joys and happiness become pale and painful due to injuries. Sometimes injuries are so serious that the participants become physically handicapped or mentally retarded for their latter part of lives, even result to death too. These unfortunate occurrences of injuries can be avoided through protective and preventive measures. In the present study an attempt has been made to measure the frequency of injuries among the participants of five combat sports during the IVth National Games held in Bangalore and Mysore (Karnataka State) from 31st May–11th June, 1997. Information regarding the frequency of injuries in Indian context were scanty. To fulfil the lacune in this field, the present study was planned.

MATERIALS AND METHODS

A total of 983 participants (both men and

women) from 25 states and services team had participated in five combat sports *viz.*, Boxing (n = 235), Fencing (n = 157), Judo (n = 177), Tackwando (n = 219), and Wrestling (n = 195) in the IVth National Games held in Bangalore and Mysore (Karnataka state) from 31st May–11th June 1997.

Of them, 207 participants got different kinds of injuries during the respective competitions. The injured participants were studied on the basis of their discipline, age, sex round, body parts and tissue parts. Age was ascertained from their school certificates. To gather the necessary information pre-structured data proforma was applied in the present study.

RESULTS AND DISCUSSION

Table 1 shows the list of injured participants disciplinewise in the IVth National Games. In Boxing, only men did participate and the frequency of injuries was 44.44% with the injury ration 0.39. In Fencing, the frequency of injuries (3.38%) was found only in men participants, no injury was reported in women counterparts. In Judo, the frequencies of injured men and women were reported as 10.73% and 6.21%, respectively with the injury ration 0.17. In Tackwando, 24.20% men and 7.76% women participants got injured representing the injury ratio 0.31. In Wrestling, the frequency of injuries were reported 3.86% only in men participants showing the injury ratio 0.04.

The list of injured participants agewise is given in table 2. In age group 20-24 years, maximum frequency of injuries in all the five combat sports *viz.*, in Boxing (46.74%), in Fencing (42.86%), in Judo (42.10% in men and 54.54% in women), in Tackwando (50.94% in men and 70.59% in women) and in Wrestling (37.50%). Though the frequency of injury in the age group 25-29 years were also alarming (30.43% in Boxing, 42.86% in Fencing, 42.10% in men Juddores, 32.07% in men and 11.76% in women Tackwando players, and 25.50% in Wrestling). In age group 15-19 years the frequencies of injuries were not very negligible too (10.87% in Boxing, 14.28% in Fencing, 5.26% in men and 36.36% in women Judo players, 11.32% in men and 17.65% in women Tackwando plays and 37.50% in Wrestling).

Table 3 gives the list of injuries based on

Table 1: Total no. of injured participants disciplinewise in the IVth National Games

S. No.	*Sport*	*No. of participants*	*No. of injured competitors*				*Injury ratio*		
			Men		*Women*		*Men*	*Women*	*Total*
			Abs. no.	*%*	*Abs. no.*	*%*			
1.	Boxing	235	92	39.15	-	-	0.39	-	0.39
2.	Fencing	157	7	4.46	0	0	0.07	0	0.04
3.	Judo	177	19	10.73	11	6.21	0.21	0.13	0.17
4.	Tackwando	219	53	24.20	17	7.76	0.35	0.25	0.31
5.	Wrestling	195	8	4.10	-	-	0.04	-	.04
	Total	983	179	18.21	28	13.66			

Table 2: Injuries based on atheletes' age

S. No.	*Sport*	*Sex*	*15-19 years*		*20-24 years*		*25-29 years*		*30+ years*		*Total injured*	
			Abs. no.	*%*	*Abs. no.*	*%*	*Abs. no.*	*%*	*Abs. no.*	*%*	*Abs. no.*	*%*
1.	Boxing	Male	10	10.87	43	46.74	28	30.43	11	11.96	92	44.44
2.	Fencing	i) Male	1	14.28	3	42.86	3	42.86	0	0	7	3.38
		ii) Female	0	0	0	0	0	0	0	0	0	0
3.	Judo	i) Male	1	5.26	8	42.10	8	42.10	2	10.53	19	9.18
		ii) Female	4	36.36	6	54.54	0	0	1	0.09	11	5.31
4.	Tackwando	i) Male	6	11.32	27	50.94	17	32.07	3	5.66	53	25.60
		ii) Female	3	17.65	12	70.59	2	11.76	0	0	17	8.21
5.	Wrestling	Male	3	37.50	3	37.50	2	25.00	0	0	8	3.86
	Total		28	13.53	102	49.27	60	29.98	17	8.21	207	100.00

their anatomical locations among the participants of the IVth National Games. In Boxing, the maximum frequency of injuries occurred on the face and head portion (64.13%), followed by parts of upper limbs (14.13%), lower limbs and chest/abdomen (10.87% in each case). In Fencing, men had the maximum frequency of injuries (57.14%) on parts of upper limbs, followed by parts of lower limbs (28.57%) and chest/abdomen (14.28%). In Judo, men had the highest frequency of injuries in the upper limbs (42.10%), followed by parts of lower limbs (31.58% in each group) and back (5.26%). The women participants in this event had the maximum frequency of injury on parts of the upper limbs (63.64%), followed by parts of lower limbs and back (18.18% in each category). In Tackwando, men had the highest frequency of injuries on the parts of lower limbs (71.15%), followed by parts of face and head portion (13.46%), parts of lower limbs (11.53%) and chest/abdomen (3.85%). The woman participants of this event had the maximum frequency of injuries on the parts of lower limbs (66.66%), followed by chest/abdomen parts (16.67%), face and head (11.11%) and back part (5.15%). In Wrestling, the maximum frequency of injuries occurred on the parts of upper limbs (37.50%), followed by parts of lower limbs and back (25.50% in each group).

The list of injured participants on the basis of match rounds during competitions is exhibited in table 4. In Boxing, the maximum frequency (41.30%) of injuries was reported in quarterfinal rounds and least in finals (5.43%). In Fencing, maximum frequency (71.43%) of injuries was reported among the men participants in semifinal rounds, followed by quarterfinal rounds

Table 3: Injuries based on anatomical locations

S. No.	Sport/Sex	Upper limb		Lower limb		Chest and abdomen		Back		Fae & head		Total	
		Abs. no.	%	Abs. no.	%	Abs. no.	%	Abs. no.	%	Abs. no.	%	Abs. no.	%
1.	Boxing												
	Men	13	14.13	10	10.87	10	10.87	-	-	59	64.13	92	44.44
2.	Fencing												
	Men	4	57.14	2	28.57	1	14.28	-	-	-	-	7	3.38
	Women	-	-	-	-	-	-	-	-	-	-	-	-
3.	Judo												
	Men	8	42.10	6	31.58	2	10.53	1	5.26	2	10.53	19	9.18
	Women	7	63.64	2	18.18	-	-	2	18.18	-	-	11	5.31
4.	Tackwando												
	Men	6	11.53	37	71.15	2	3.84	-	-	7	13.46	52	25.12
	Women	-	-	12	66.66	3	16.67	1	5.55	2	11.11	18	8.69
5.	Wrestling												
	Men	3	37.50	2	25.00	-	-	2	25.00	1	12.50	8	3.86
	Total	41	19.81	71	34.30	18	8.69	6	2.90	71	34.30	207	100.00

Table 4: Number of athletes injured during particular match rounds

S. No.	Sport/Sex		Preliminary		Quarter final		Semi final		Final		Total no. of injuries	
			Abs. no.	%	Abs. no.	%	Abs. no.	%	Abs. no.	%	Abs. no.	%
1.	Boxing	Men	37	40.22	38	41.30	12	13.04	5	5.43	92	44.44
2.	Fencing	Men	0	0	2	28.57	5	71.43	0	0	7	3.38
		Women	0	0	0	0	0	0	0	0	0	0
3.	Judo	Men	3	15.79	3	15.79	8	42.10	5	26.31	19	9.18
		Women	4	36.36	6	54.54	0	0	1	9.09	11	5.31
4.	Tackwando	Men	21	39.62	21	39.62	8	15.09	3	5.66	53	25.60
		Women	4	23.53	9	52.94	2	11.76	2	11.76	17	8.21
5.	Wrestling	Men	8	100.00	0	0	0	0	0	0	8	3.86
	Total		77	37.20	79	38.16	35	16.91	16	7.73	207	100.00

(28.57%). In Judo, men participants had the highest frequency of injuries (42.10%) in semi-final rounds and lowest in preliminary and quarterfinal rounds (15.79% in each group). In women, maximum frequency (54.5%) of injuries as reported in quarterfinal rounds and minimum in finals (9.09%). In Tackwando, maximum frequency (39.62%) of injuries has been reported in men in preliminary and quarterfinal rounds and least in finals (5.66%) and in women the highest frequency (52.94%) of injuries was observed in quarterfinal rounds followed by finals (11.76%). In Wrestling, all the injuries occurred during the preliminary rounds.

Table 5 shows the classification of injuries based on tissue parts. In Boxing, maximum frequency (59.78%) of injuries occurred in skin and soft tissues, followed by bone and joint (22.83%), musculo-tendinous and ligament (8.69%). In Fencing, men got the maximum injuries (57.14%) in the ligaments, followed by musculo-tendinous (28.57%), and skin and soft tissues (14.28%). Once again women had no reported injury. In Judo, men had the highest frequency (47.37%) of injuries in musculo-tendinous group, followed by ligament (23.31%), skin and soft tissue (15.79%) and bone and joint (10.53%). In women, maximum frequency (45.45%) of injuries was reported in skin and soft tissues and the least (9.09%) in bone and joint parts. In Tackwando, men had the maximum frequency (64.70%) in skin and soft tissues and least in bone and joints (5.88%). In Wrestling, maximum frequency (37.05%) of injuries was reported in skin and soft tissues and bone and joint parts, followed by ligaments (25.00%).

Table 5: Injuries based on tissue wise

S. No.	Sport/Sex		Bone & joint		Musculo tendinous		Ligament		Skin & soft tissues		Total no. of injuries	
			Abs. no.	%	Abs. no.	%	Abs. no.	%	Abs. no.	%	Abs. no.	%
1.	Boxing	Men	21	22.83	8	8.69	8	8.69	55	59.78	92	44.44
2.	Fencing	Men	0	0	2	28.57	4	57.14	1	14.28	7	3.38
		Women	0	0	0	0	0	0	0	0	0	0
3.	Judo	Men	2	10.53	9	47.27	5	26.31	3	15.79	19	9.18
		Women	1	9.09	3	27.27	2	18.18	5	45.45	11	5.31
4.	Tackwando	Men	3	5.66	18	33.96	5	9.43	27	50.94	53	25.60
		Women	1	5.88	2	11.76	3	17.65	11	64.70	17	8.21
5.	Wrestling	Men	3	37.50	0	0	2	25.00	3	37.50	8	3.86
	Total		31	14.97	42	20.29	29	14.00	105	50.72	207	100.00

Table 6: Different types of injuries in combat sports during the IVth National Games - 1997

S. No.	Sport/Sex	Sprain & strain		Contusion		Laceration		Abrasion		Dislocation & subluxation		Fracture		Concussion		Total number	
		Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
1.	Boxing																
	Male	20	9.66	10	4.83	27	13.04	9	4.35	1	0.48	5	2.41	20	9.66	92	44.44
2.	Fencing																
	Male	7	3.38	-	-	-	-	-	-	-	-	-	-	-	-	7	3.38
	Female	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.	Judo																
	Male	13	6.28	-	-	1	0.48	1	0.48	2	0.97	-	-	-	-	17	14.49
	Female	6	2.90	3	1.45	-	-	2	0.97	2	0.97	-	-	-	-	13	6.28
4.	Tackwando																
	Male	23	11.11	21	10.14	3	1.45	2	0.97	3	1.45	1	0.48	-	-	53	25.60
	Female	4	1.93	9	4.35	1	0.48	2	0.97	1	0.48	-	-	-	-	17	8.21
5.	Wrestling																
	Male	4	1.93	2	0.97	1	0.48	-	-	1	0.48	-	-	-	-	8	3.86
	Total	77	0.37	45	21.74	33	15.94	9	4.35	10	4.83	13	6.28	20	9.96	207	100.00

List of different types of injuries in participants of live combat games in given in table 6. In Boxing, the maximum frequency (13.04%) was reported in laceration, followed by sprain and strain and concussion (9.66% in each case), contussion (4.83%) and abrasion (4.35%).

The reasons for the high frequency of injuries in Boxing may be direct collision and aggressive body contact, especially on the exposed parts of face causing skin and soft tissue injuries like abrasion and laceration of face. The skin becomes swollen or there may be lumps of swollen tissues due to edema and haemarrhagge. The second most injury prone event was Tackwando. In this sport the lower limbs are mainly used in the application of many techniques. In accordance with the distance between the players, the whole body would bent, extent, rotate or propel at an accelerating speed. The main purpose of such motion is to increase the attacking or defending effects which lead to injuries because of imbalance. Inversion sprain of the ankle, due to fast footwork were involved in injuries. Tackwando is played in bare foot, hence the feet have no ankle support. Hamstring tears commonly occurred. Slippery floors can cause possible avulsion fracture of the ischial tuberosity especially in young competitors. The injuries were reported in the skin and soft tissues including contusion and haematoma of the abdomen, genital organ, eyes, lips lacerations, nose abrasions etc. Injuries in Judo were moderate and a very few injuries in Fencing and Wrestling were reported.

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