

**A SURVEY OF BADMINTON INJURIES**

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*\*Department of Physical Education, University of Georgia, Athens, Georgia 30602, U.S.A.**†Department of Human Kinetics and Leisure Studies, George Washington University, Washington, D.C. 20052, U.S.A.***ABSTRACT**

A Badminton Injury Questionnaire (BIQ) was developed to survey the type and frequency of injuries that are likely to occur from playing competitive badminton. Two hundred and thirty-one players, ranging from club players to international champions, completed the survey which indicated an injury incidence rate of .09 and .14 injuries per person per year for male and female badminton players respectively.

Badminton participation resulted in relatively few injuries, most of which were cramps, blisters, strains and sprains of the lower extremities and a surprisingly low incidence of tennis elbow.

**INTRODUCTION**

The purpose of this study was to determine the incidence and type of injuries associated with participation in competitive badminton. Although badminton is a non-contact sport, the game requires jumps, lunges, quick changes in direction, and rapid arm movements in order to stroke the shuttlecock from a variety of postural positions. Thus, the physical demands of a competitive game of badminton suggest that injuries to the limbs may be a prevalent ailment.

Although it has traditionally been accepted that injuries associated with badminton are minimal, few reports substantiate this notion. According to Izen (1971), acute and subacute injuries resulting from participation in the sport of badminton are primarily tears, sprains, strains, bruises, cuts, and fractures of the lower extremities and the shoulder. He further indicated that constant shoulder stress often causes chronic bursitis and tendonitis, whereas the most prevalent arm injury involves the elbow. In addition to strains, sprains, and tears, Mills (1977) reports tennis elbow, heel bruises, lower back injuries, friction burns, and eye injuries to be prominent among badminton players.

Eye injuries have been reported amongst badminton players in two recent studies. Chandran (1974) reports that 63 ocular injuries to badminton players over a five year period accounted for two-thirds of all sports related eye injuries in Malaysia. He indicated a prevalence of these injuries among inexperienced players. During the 1976-1977 season, 11 eye injuries resulting from badminton were recorded in Canada, two of which resulted in legal blindness (Ryan, 1978).

Although the information concerning the ocular injuries was quite specific, the reports of other injuries to

badminton players have been based on personal observation and experience rather than a survey method of data collection. The purpose of the present paper, therefore, was to present specific data concerning the incidence and type of injuries male and female badminton competitors are likely to suffer.

**METHODS**

Data were obtained from 231 participants in sanctioned badminton tournaments during the 1976-1977 season. These tournaments included regional tournaments in the United States and Canada, as well as the U.S. Open Badminton Championships. This sample included U.S., Canadian, Mexican, and European champions, as well as class A, B, and C players.

The Badminton Injury Questionnaire (BIQ) was developed to provide specific information concerning badminton injuries. Data were obtained by having tournament participants complete the BIQ regarding the nature and extent of injuries they had received while playing badminton. For purposes of this study, an injury was defined as any lesion that was incurred which was debilitating to the player's performance. The BIQ provided for the recording of the following types of injuries: blisters, cramps, bruises, sprains and ligament injuries, muscle strains and tears, tendonitis and tendon injuries, bursitis, cartilage injuries, fractures, pinched nerve, lacerations, and eye injuries. Although blisters and cramps may not be recognised as injuries by some classification systems, the authors felt that this data would be informative. Data collected included the player's age, sex, height, weight, number of years playing badminton, practice schedule, as well as type, location, cause, frequency, and severity of injury. In addition, the questionnaire sought information concerning type of treatment, cost of treatment, and time lost from badminton participation as a result of the injuries. The BIQ was personally

administered by the investigators who screened the records for completeness and appropriateness in method of recording the responses.

## RESULTS AND DISCUSSION

A profile of the BIQ respondents is presented in Table I. The average man had played badminton for 13 years, which included 11 years of tournament experience. For women, these periods were 10 years playing, with 8 years tournament participation. Due to the cross section of players sought for this survey, some players were non-tournament players or had retired from active tournament competition at the time the BIQ was administered. Of the 231 badminton players surveyed, 82% indicated that they had suffered from at least one injury while playing badminton.

TABLE I

Characteristics of the Typical Badminton Player surveyed

	Men (n=157)		Women (n=74)	
	$\bar{X}$	SD	$\bar{X}$	SD
Age	33	13.07	27	8.24
Height	177.8 cm	7.34	165.1 cm	7.26
Weight	73.8 kg	9.22	57.2 kg	6.29
Years played badminton	13.4 yr	10.10	9.5 yr	8.44
Years played tournaments	10.7 yr	9.36	7.8 yr	7.31
No. reporting at least 1 injury	130 (82.8%)		60 (81.1%)	
Injuries per year	.09		.14	

The number and type of injuries reported by badminton players surveyed are shown in Table II. Blisters and cramps were considered minor ailments but were reported as injuries by a significant number of players. Although the incidence of blisters was similar for men and women, 39.5% and 37.8% respectively, women reported a lower incidence of muscle cramps than men, 9.5% as compared to 27.4% for men. It was hypothesised that the reason men reported a higher incidence of muscle cramps than women may be related, in part, to the fact that men, on the average, possess a greater proportion of muscle mass than women and that a men's singles game is 15 points, whereas women play an 11 point game.

Bruises, which might also be classified as a minor ailment, occurred more frequently in women (23.2%) than men (8.2%). There were approximately equal occurrences of injuries resulting from being struck on the head with the shuttle, being struck with own or partners racquet, collision with partner, or falling. Thirteen percent of the bruise injuries were treated by a trainer, while the rest were self-treated.

Sprain or ligament injuries occurred about equally among men and women, with about 44% of all players suffering from at least one ligament injury over an average of 12 years of badminton play. As might be expected, 87% of these injuries were ankle (70%) or knee (17%) injuries. Six players reported being hospitalised, of which four required surgery, as a result of ligament injuries.

About 49% of the players reported muscle strains, tears, or tendon injuries. Pulled muscles were reported much more frequently in the calf and thigh (41.3%) than in the groin (22.2%) or arm (6%). Twenty-five percent of those injured were treated by a physician, but only one person was hospitalised due to muscle injuries.

TABLE II

Type and incidence of injuries reported from playing badminton

INJURY	No. of men reporting injury	% of men reporting injury	No. of women reporting injury	% of women reporting injury	% of total reporting injury
Blisters	62	39.5	28	37.8	38.9
Muscle cramps	43	27.4	7	9.5	21.3
Bruises	13	8.2	17	23.2	12.9
Sprains or ligament injuries	67	42.7	34	41.0	43.7
Muscle strains or tears	46	29.3	18	24.3	27.7
Tendonitis or other tendon injuries	38	24.2	11	14.9	21.2
Bursitis	11	7.0	4	5.4	6.5
Cartilage injuries	2	1.3	1	1.3	1.3
Fractures	4	2.5	2	2.7	2.6
Eye injuries	9	5.7	7	9.5	6.9
Other	8	5.0	3	4.0	4.7

**TABLE III**  
**Type and incidence of chronic injuries**  
**reported from playing badminton**

INJURY	No. Reporting Recurring injuries <sup>1</sup>		No. Reporting Chronic injuries <sup>2</sup>	
	Men	Women	Men	Women
Blisters	30	8	8	6
Muscle cramps	20	2	3	0
Bruises	6	5	1	6
Sprains or ligament injuries	37	22	4	1
Muscle strains or tears	35	10	0	1
Tendonitis or other tendon injuries	22	5	8	2
Bursitis	5	2	2	2
Cartilage injuries	2	1	0	0
Fractures	3	1	0	0
Eye injuries	4	4	0	0
Other	0	0	0	0

<sup>1</sup> *Recurring injuries: reported 2-5 times*

<sup>2</sup> *Chronic injuries: reported more than 5 times*

Tennis elbow comprised 8.7% of the injuries or 60% of the tendonitis injuries. Tendonitis injuries were equally prevalent among men and women. Eight of these injuries were reported as chronic and only four players reported wearing protective elbow bands. The occurrence of achilles tendon injuries affected only 2.6% of the population surveyed.

Seven percent of the players reported receiving an eye injury. Eighty-one percent of these injuries were from a shuttlecock hit by an opponent. Injuries occurred less frequently as a result of one's partner returning the shuttle or by the shuttle glancing off one's racquet and striking the eye. Three of the 16 injuries required hospitalisation and one person had surgery.

Bursitis was evidenced by 6.5% of the players surveyed. Sixty percent of these cases were associated with shoulder ailments.

Fractures, lacerations, pinched nerves, concussions, and cartilage injuries were very infrequent. No more than 3% of the players received any one of these injuries over an average of 12 years playing experience.

The injury incidence for men was 1.91 injuries per person over an average of 11 years, and for women, 1.78 injuries per person over an 8 year period. Eliminating the minor ailments, the injury incidence was 1.24 for men and 1.31 for women. These data represent injury rates of .09 and .14 injuries per person per year for men and

women, respectively. Thus a male player may be expected to suffer from a new injury about every 11 years and a female player about every 7 years.

The incidence of receiving chronic injuries is presented in Table III. It was interesting to note that excluding the minor ailments of blisters, cramps, and bruises, only 20 players (8.6% of the population surveyed) reported any of their injuries to have been chronic. It was also noted that only 8 people (3.4%) wore a brace or band for the elbow, whereas it has been estimated that nearly one-half of all tennis players over age 35 will have had tennis elbow sometime during their playing career (Allman, 1975). It was estimated from these data that about 5% of the badminton players will experience tennis elbow at some time during a playing period covering 10-13 years.

**TABLE IV**  
**Distribution of badminton injuries relative to anatomical location**

Location or Body Part	% of Total Injuries		
	Men	Women	Total
Ankle/Foot	42	45	43
Knee	7	12	9
Leg	22	7	17
Shoulder	2	3	2
Elbow	8	10	9
Arm	4	4	4
Hand/Wrist	6	8	6
Head/Neck	1	1	1
Eye/Face	4	6	4
Back	1	1	1
Groin	4	3	4

The body parts most often involved with badminton injuries are shown in Table IV. Percentage values were used rather than raw data in order to permit meaningful comparisons between men and women. The percentages indicated are the relationship of specific body parts to the total number of injuries reported. Most of the injuries reported were to the limbs, with the lower extremities comprising almost 70% of all injuries. It was interesting to note that only three injuries, or 1%, were associated with ailments involving the back. It can be seen in Table IV that the relative incidence of injury to the various body parts was quite similar for both men and women, with the only substantial difference involving the legs. This difference was mainly due to more muscle cramps being reported among men.

**TABLE V**  
**Classification of badminton injuries by aetiology**

Aetiology	% of Total Injuries		
	Men	Women	Total
<b>Extrinsic</b>			
Collision — Environmental	2	5	3
Collision — Human	21	13	19
Implemental — Racquet	6	11	7
Implemental — Shuttle	4	11	6
<b>Intrinsic</b>			
Retrieving/Positioning	35%	40%	36%
Stroking	32	20	29

The predominant cause of badminton related injury was intrinsic in nature, such as moving to retrieve the shuttle or in the stroking action itself. Almost one in five injuries, however, were the result of a collision with another person, mostly one's partner while playing doubles. Surprisingly, injuries caused by being struck by the racquet and the shuttle represented only 7% and 6% of all injuries, respectively. The incidence of injuries by aetiology is indicated in Table V.

**TABLE VI**  
**Classification of badminton injuries by event played**

Event	% of Total Injuries		
	Men	Women	Total
Singles	56	45	53
Doubles	35	33	34
Mixed Doubles	7	18	10
Warmup/Practice	2	4	3

Injuries were further classified according to the event being played at the time (singles, doubles, mixed doubles, or warmup/practice). As might be expected, considering the proportion of intrinsic injuries, the majority of injuries sustained in competitive badminton occurred while playing singles. Table VI provides a percentage breakdown of all injuries relative to the event being played. It should be noted that the relative classification by event is similar for men and women, but that women report a substantially higher proportion of injuries during mixed doubles play than do men.

Although the performer surveyed reported a total of more than 400 injuries that were debilitating to their performance, many of these injuries may be considered trivial by the sports physician. In an attempt to ascertain its severity, each injury was classified as to the treatment required (Table VI). The incidence of severe injuries requiring treatment by a physician and/or hospitalisation was strikingly low. In fact, less than one in five reported injuries was considered major enough to require treatment by a physician.

## CONCLUSIONS

Soft tissue injuries to the limbs, particularly the legs, were the most predominant injuries among both men and women badminton players. The majority of injuries were intrinsic by nature and few would be diagnosed as severe. The surprisingly low likelihood of receiving an injury was about .09 and .14 injuries per person per year for men and women, respectively. Treatment of injury was generally self-imposed, although the proportion of injuries requiring a physician's attention was particularly high among eye injuries.

**TABLE VII**  
**Severity of badminton injuries based upon treatment**

Treatment Required	Number of Injuries		
	Men	Women	Total
Physician	48	30	78
Hospitalisation	5	8	13

Although this badminton injury survey supports the findings of Izen (1971) and Mills (1977) in that most badminton related injuries are muscle tears, strains, sprains, and bruises, we found some striking differences. First, fractures, lacerations, and back injuries were almost non-existent, and heel bruises and shoulder injuries were very rare (less than 2% of the population surveyed reporting either). Secondly, and probably the most interesting finding was that only 20 of 231 players had ever experienced tennis elbow, of whom only seven were treated by a physician, over an average playing period of 12 years. Of these, three were recurrences of non-badminton related injuries.

From an orthopaedic point of view, badminton appears to be a relatively safe form of exercise resulting in only slight injuries to the musculoskeletal system.

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