



# Injury Patterns among Turkish Archers

H. Ertan\*, M. Tüzün\*

\* Middle East Technical University, Physical Education and Sports Department, Ankara/Turkey



## INTRODUCTION

➔ To understand the injury patterns in archery, it is necessary to review the normal shooting patterns that are involved. As the archer starts to draw the string back, the drawing arm is held at 90° or greater abduction and the shoulder is flexed across the body. During drawing phase the arm maintains 90° or greater abduction as the arm unit extends across the body towards full draw. This action is referred to as horizontal extension (Pappas et al., 1985) and probably contributes to the shoulder injuries observed.

➔ Full draw is maintained for several seconds while the archer aims and then releases the string. Universally, in archery, this weight is measured in pounds (lb) (Mann, 1989).

➔ In Mann and Littke's (1989) study 21 elite archers were studied and their shoulder injuries were documented; the injuries were correlated to anatomical dissections. Injuries to the drawing arm shoulder in female archers were found to be the most prevalent type of injury. It was suggested that factors involved included lack of specific rotator cuff training, coupled with overtraining and inappropriate technique (Mann, 1994).

➔ **The purpose of present study** was to identify the injury patterns that are seen among Turkish Archers.

## METHODOLOGY

### Sample

88 archers (25 male, 13 female, 27 junior male, 23 junior female) who have taken part the Turkish Archery Championship (age: 12 - 48, x: 23.852 ± 5.719, height: 160 - 195 cm, x: 175.053 ± 8.986, body weight: 46 - 94, x: 66.013 ± 11.852, training age: 1 - 27, x: 5.060 ± 4.005) participated in this study (Table 1).

	Male	Female	Junior Male	Junior Female	Total
Number	25	13	27	23	88
Age	28 ± 3.5	26.5 ± 5.2	16.7 ± 2.5	16.2 ± 2.8	23.8 ± 5.7
Height	182.5 ± 12.2	168.3 ± 15.7	179.2 ± 5.81	171.4 ± 6.2	175.0 ± 8.9
Body Weight	84.2 ± 13.7	72.4 ± 11.4	53.4 ± 10.8	55.3 ± 5.2	66.0 ± 11.8
Training Age	9	7	0.9	0.7	5.0 ± 4.0

Table 1: The number, age, height, body weight, and training years of subjects.

	Mean	Std.	Min.	Max.	N
Training Sessions They have in a week	4.453	1.662	1	7	88
The Duration of a training session (hr)	2.763	0.826	1.5	5	88
Number of Arrows Shot in Session	168.45	60.58	50	300	88
Bow weight in kg	18.063	2.719	12	26	88

Table 2: General characteristics of archery training methods.

When we consider the mean scores it appears that the archers train 4 or 5 days a week, a training session takes about 3 hours. They shoot almost 168 arrows in a single session (Table 2). When the number of arrows shot in a single session is multiplied with drawing bow weight, the result is 3042.72 kg. Thus, they do work of 3 tons in a single session and 13.5 tons in a week.



## RESULTS

### Data collection Instrument and Procedure

The prepared questionnaire was applied during the 2000 Turkish Archery Championship. There were descriptive questions in the questionnaire to gather information about the general characteristics (gender, age, height, body weight, and training years) of the sample. Beside these, there were questions about training sessions, the number of arrows shot in a session, and the drawing weight in the questionnaire. The questionnaire was distributed to the archers during the competition in appropriate breaks in order not to distract competitors. The questionnaire was the only source of information on injuries; there was no other instrument or clinical application in this study.



	The number of injuries	Incidence (%)
Neck and Back Injuries	2	2.66
Drawing-arm Shoulder Injuries	11	14.66
Bow-arm Shoulder Injuries	4	5.33
Drawing-arm Wrist Injuries	9	12
Drawing-arm Hand Injuries	6	8
Blisters on Fingers	15	20
String Touch	8	10.66
Drawing-arm Elbow	1	1.33
Achil Tendon	1	1.33

Table 3: The parts of body that injured during the last two years.

Results of the questionnaire showed that out of 88 subjects 38 had no complaint in terms of injuries, and 50 had some injury patterns to different parts of their bodies. It can be deduced from the table 3 that the most common injury among the archers is "Blisters on Drawing Fingers" with the percentage of 20. "Drawing-arm shoulder" also has a wide range with 11 injuries and 14.66 incidences. However, "Drawing-arm elbow" and "Achilles tendon" have the lowest incidence rate among the injury patterns. Some of the archers had just a single injury pattern. On the other hand, some of them had a couple of injuries on different parts of their bodies.

## DISCUSSION

➔ It can be deduced that the most prevalent injury pattern is blisters on fingers. This may be caused by drawing weight of the bow, and the number of arrows that are shot in a single session. The thickness of the bowstring is a high load on these three fingers. Blisters are encountered due to excessive shooting and are managed in the usual way. Mann (1994) advised that the solution is assuming proper hand position on the string, adding spacers between the fingers, using a longer bow and adding extra padding to the prospective tab.

➔ The second most pervasive type of injury was "Drawing - arm shoulder" injuries. This result is supported by Mann and Littke (1989). Archery places asymmetrical stress on the shoulder structures especially on the Drawing - arm shoulder. On the average, two - thirds of the injuries occur on the different parts of the drawing - arm. Thus, archers should pay more attention to the drawing - arm by doing warming-up and cooling down exercises before and after practice.

➔ The high percentage of 10.66 for string touches stems from the sample. In the present study not all the archers were elite. Almost half of them were novice archers. Thus, they may tend to have more string touches than elite archers because their arming technique in the bow arm and releasing technique in the drawing arm may not be suitable for arrow release. Incorrect release movement may cause lateral deflection on the string toward the bow handle.

➔ Archers should be very careful about injuries like all other sportsmen. They have to pay attention especially to drawing - arm. Before injury; (1) they should do warm-up and stretching exercises before training session, (2) they should include strengthening weight-training programs, (3) and finally they should be careful about drawing weight of the bow and the number of arrow shot in a single session. During the injury, they should follow scientific instructions given by specialists. After injury period, the duration of any session and the intensity of training should be low.

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Corresponding Author:  
Hayri ERTAN  
Tel: 312 210 40 25  
e-mail: hertan@metu.edu.tr