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FREQUENCY AND CAUSES OF INJURIES IN WOMEN ATHLETES OF BASKETBALL B LEAGUE OF TURKEY

Eda Semikan Öğün,
Yücel Ocak[i]
Afyon Kocatepe University,
School of Physical Education and Sports,
Turkey

Abstract:
Sports are a social activity that has existed throughout human history. Basketball, as a sports branch, has been in continuous development since the first day it emerged. Basketball is one of the most popular hall sports played all over the world. Anyone who wants to play basketball must have certain characteristics, one of the most important of which is height.

Keywords: injuries, women athletes, basketball

1. Introduction

Although being tall is an important advantage in Basketball, it increases the risk of injury (McKay et al., 2001). Betty Retnowulan et al (2017), that each variable of body height, arm length and arm muscle strength had a positive relationship with the ability of free throw shoot.

Though sports can substantially contribute to physical well-being, there are some risk factors that are common and mostly beyond one's control. The most important of these risk factors are injuries, which can be evaluated under two headings as internal and external that vary according to sports branches.

Sports injuries occur when force exerted on the entire body, or part of the body exceeds the strength of the tissue (Uğur et al. 1999). The structures of sports branches and training methods have positive effects on bone mineral density as well as on

[i] Correspondence: email yocak@aku.edu.tr

muscular development. High bone mineral density also positively affects bone injuries (Ocak and Gölünük, 2016). Most sports injuries can be temporary while some threaten athletes' career and success. Depending on the seriousness of the injury, the athlete may have to retire or permanently stop playing. One of the greatest risks of sports injuries is the waste of money and time spent on athletes. Therefore, prevention of sports injuries and rehabilitation of injured athletes are of great significance.

The aim of this study is to determine the occurrence of basketball injuries, their effect on basketball players, and their consequences.

2. Material Method

2.1 Research method

Data were collected using a 19-item questionnaire. Study sample consists of 81 women athletes of Basketball B League of Turkey. The questionnaire consists of 3 sections; 1) general information, 2) internal and external factors causing injuries and 3) treatments applied at the time of an injury and injury prevention strategies.

Previous studies and questionnaires were reviewed prior to the preparation of the questionnaire, which was administered, as a pretest, to 20 people. Pretest results were used to establish the validity and reliability of the questionnaire, which was then finalized based on expert opinion.

2.2 Data Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS), version 15. A one-way analysis of variance was performed and results were plotted as frequency, percentage distribution and significance at $P < 0.05$ and $P < 0.001$.

3. Results

Table 1: Demographic Information of Participants

Parameter	Varıables	N	%
Age	7-14	8	9,9
	15-18	36	44,4
	19 and over	37	45,7
Educational Level	Primary Education	8	9,9
	High School	38	46,9
	University	35	43,2
Basketball History	Less than 2 years	14	17,3
	2-4 years	29	35,8
	5 years and over	38	46,9

Table 2: Percentage Distribution of Injury Rates by Age

Age	N (%)	Injury		Total	Chi Square	P
		Yes	No			
7-14	N	2	6	8	17,678	0,001
	(%)	25,0	75,0	100,0		
15-18	N	12	24	36		
	(%)	33,3	66,7	100,0		
19 and over	N	29	8	37		
	(%)	78,4	21,6	100,0		
Total	N	43	38	81		
	(%)	53,1	46,9	100,0		

P<0,001

78.4% of athletes over 19 years of age stated that they had been injured. This difference is also statistically significant.

Table 3: Effect of Training Method on Injury Rates by Age

Age	N (%)	Activity			Total	Chi Square	P
		Training	Competetion	Other Branch Activities			
7-14	N	2	2	4	8	19,734	0,003
	(%)	25,0	25,0	50,0	100,0		
15-18	N	16	6	14	36		
	(%)	44,4	16,7	38,9	100,0		
19 and over	N	11	21	5	37		
	(%)	29,7	56,8	13,5	100,0		
Toplam	N	29	29	23	81		
	(%)	35,8	35,8	18,4	100,0		

P<0,001

Injury rates during training were highest among athletes aged 15 to 18 years (44.4%) while those during competition were highest among athletes over 19 years of age (56.8%). This difference is also statistically significant.

Table 4: Effect of Floor Type and Number of Weekly Training on Injury Rates

Sports Ground		Weekly Training						Total	Chi Square	P
		2	3	4	5	6	7 <			
Living Room (parquet)	**N**	5	14	6	15	4	0	44	29,781	0,013
	%	11,4	31,8	13,6	34,1	9,1	-	100,0		
Grass	**N**	0	2	2	0	0	0	4		

	%	-	50	50	-	-	-	100
Concrete	**N**	6	2	4	7	5	2	26
	%	23,1	7,7	15,4	26,9	19,2	7,7	100
Soil	**N**	1	6	0	0	0	0	7
	%	14,3	85,7	-	-	-	-	100
Total	**N**	12	24	12	22	9	2	81
	%	14,8	29,6	14,8	27,2	11,1	2,5	100

P<0,001

There is a statistically significant effect of floor type and number of weekly training on injury rates.

Table 5: Injury and Treatment Rates of Participants

Parameter	Varıable	N	%
Whether they received help after the injury in the last year	Yes	60	74,1
	No	21	25,9
Therapy or Material Usage	Yes	57	70,4
	No	24	29,6

Table 6: Reasons and Types of Injuries of Participants

Parameter	Varıable	N	%
What kind of work are you doing when you are injured?	Weight	3	3,7
	Sıçrama	16	19,8
	Running	29	35,8
	Technical Study	33	40,7
The activity that causes often to undergo injury	Training	29	35,8
	Competition	29	35,8
	Other Branch Activities	23	28,4
İnjury Shape	Hit	11	13,6
	Fall	30	37,0
	İmpact	40	49,4
Factors Causing Injury	Deficient training in the preparation	17	21,0
	Overtraining	20	24,7
	Sneakers	15	18,5
	Hall or playground	13	16,0
	Struggle with competitor	16	19,7

Floor that causes to undergo injury	Hall (Parquet)	44	54,3
	Grass	4	4,9
	Concrete	26	32,1
	Soil	7	8,6
The most common injuries	Sprain	23	28,4
	Bleeding	6	7,4
	Crushing	19	23,5
	Laceration	19	23,5
	Tendon or fiber breakage	9	11,1
	Cracked or broken	3	3,7
	Dislocation	2	2,5
Regions of İnjury	Foot-Foot Sharpener	41	50,6
	Knee Injuries	9	11,1
	Hip-leg Injuries	15	18,5
	Achilles-Patellar Tendon Injuries	8	9,9
	Waist-Back Injuries	3	3,7
	Front Arm Injuries	3	3,7
	Shoulder-Elbow Injuries	2	2,4

4. Discussion and Conclusion

81 women athletes of Basketball B League of Turkey voluntarily participated in the study. 17.3%, 35.8% and 46.9% of participants have been playing basketball for less than 2 years, for 2 to 4 years and for 5 years and more, respectively.

Results show that 39.5% of athletes are injured during training. This high rate may be due to overloading, faulty materials and improper floor conditions. Determination of training methods based on athletes' training levels and physical characteristics may reduce injury rates. The risk of injury may also be reduced by trainees modifying and improving training plans based on these conditions. Participants also stated that they did not fully develop basic motor skills, and strength and resilience required by the sports branch before starting training (Spiteri et al. 2014), which, according to them, was the reason for high rates of injury during training. Bolotin and Bakayev (2016) state that pre-season isometric exercises are effective in preventing injuries in basketball players. Noyes et al. (2012) state that pre-season jump exercises increase knee and leg strengths of basketball players and therefore have a preventive effect on injuries.

In general, the incidence of injury among athletes is reported to be over 50% in the literature. In this study, injury rates of participants during training and competition are almost equal. 35% of both groups reported injury while 28.4% stated that they were

injured when performing a different activity. This indicates that injury rates during training and competition are higher than those during a different activity. Bavlı and Kozanoğlu (2008) report that the highest rates of injury (62.1%) occur during competition. Diniz and Ketenci (2000) and Duruöz et al (2004) report 60-70% of injuries occurring during competition and 30-40% of injuries occurring during training.

The literature shows that injury rates among athletes during competition reach almost 60%. Many researchers state that up to 70% of athletes are injured during competition. The results of this study show that 35-40% of athletes are injured during competition and 35-40% of athletes are injured during training. The sum of these means amounts to 70-80% (Zuckerman, S. L et al., 2016, Leanne et al., 2016). Another noteworthy finding is that participants perform training exercises with a high level of intensity and motivation that is similar to the conditions of an actual competition.

Rates of injury due to floor conditions show that the parquet floor causes the highest rate of injury (54.3%). Uluöz (2007) found that 66.3% of 101 athletes perform training on parquet floors while the remaining 33.7% perform training on synthetic floors. He reports that 35.8% of these athletes have experienced at least one injury while 64.2% have experienced no injuries. He also states that 41.2% of athletes performing training mostly on synthetic floors had at least one injury while 58.8% had no injuries.

This study shows that impact-related (46.9%) and fall-related injuries (37%) are the two most common types of injuries. Participants report that they are likely to experience impact-related, fall-related and bump-related injuries during training and competition (Uluöz, 2007). This is related to the characteristics of the sports branch.

Athletes are known to be more exposed to falls and bumps especially in sports branches that require one-to-one contact. Bavlı and Kozanoğlu (2008) report that the most common type of injury is sprains (67.2%) and that injury rates are highest (62%) during competition.

In this study, the rate of sprains is 28.4%. Basketball is a type of sports played at a fast pace with a lot of movements such as jumping and sudden change of direction. Besides, basketball players are very tall and therefore jumping adds more loads on their ankles and knee joints. In order to minimize these loads, basketball players wear specially designed sport shoes during competitions. Therefore, high rates of sprains may be due to the characteristic of the sports branch.

74.1% of participants reported that they had received first aid treatment after the injury in the last year. This rate shows that participants are informed of the importance of first aid and that they are aware that receiving first-aid treatment may result in a quicker recovery.

70.4% of participants use preventive or therapeutic equipment. Uluöz found that 76.2% of 101 athletes use protective equipment during training and competition (Uluöz 2007).

50.6% of participants experienced foot and ankle injuries, which are also the most common injuries reported in the literature (Nelson et al., 2007, Önçağ et al 1988, Cumps et al 2007).

Kıratlı and Sanioğlu (2005) stated that the most common injuries in basketball players are ankle sprains (46.15%), knee ligament-tendon injuries/meniscus damage (17.95%) and back injuries (15.38%).

In a similar study, McKay et al. (2001) reported that the most common injuries in basketball players are ankle (1.25%) and knee injuries (0.29%). Pasanen et al. (2017) report that 78% of injuries in young female and male basketball players occur in the lower limbs. They state that ankles (48%) and knees (15%) are the most frequently injured body parts and that the majority of injuries occur in joints or ligaments (67%).

Hickey et al. (1997) report that the most injured regions are knee (18.8%), ankle (11.7%) and waist (11.7%) in female basketball players. Similar studies show that sports injuries occur mostly in the lower extremity region (McCarthy et al., 2013, Munro et al., 2012, Deitch et al., 2006). This can be expressed as a sports-specific reality.

Results show that injury rates during training are highest among athletes aged 15 to 18 years (44.4%) while injury rates during competition are highest among athletes over 19 years of age (56.8%). This difference is also statistically significant ($p< 0.05$).

78.4% of athletes over 19 years of age state that they had been injured while 21.6% state that they did not. This is a statistically significant difference ($p< 0.001$).

Results also show that there is a statistically significant effect of floor type and number of weekly training on injury rates ($p< 0.05$).

In conclusion, the majority of basketball players are injured and most of these injuries occur in the form of sprains in the lower extremity. Injuries are more likely to occur during overloading and technical training. The vast majority of participants use preventive or therapeutic equipment. After injury, most participants receive first aid treatment.

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