

The Evaluation of the Athlete's Injury Cases who Make Trampoline Gymnastic at Denmark Ollerup Gymnastic High School

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ABSTRACT: In this study, it is aimed to determine and inquire the reasons of the injuries of gymnasts at Ollerup gymnastic high school in Denmark and to make the institutions, athletes and trainers aware of the subject. The sample of the study consists of 30 male and 9 female gymnasts whose ages are $20,87 \pm 1,86$ and who are trained at Ollerup gymnastic high school. The injury cases of the gymnasts are determined through 24 questions information and questionnaire form. The %47,3 of the gymnasts participated in the research told that their injuries were on their feet and ankles whereas %16,4 was at lower back. The types of the injuries are %36,4 twist, %18,2 tension. The reasons of the injuries are %43,6 overload, %14,5 mental factors and %27,3 other unknown reasons. When the treatment method in the recovery period considered rest covers %41,8 and physiotherapy covers %32,7 of the period. As a result of the study, it is thought that the study is useful to determine and inquire the reasons of the injuries of the gymnasts, to decrease the number of injuries and to find out precautions for the injuries and to make the institutions, athletes and trainers aware of the subject.

Keywords: Tumbling Gymnastics, Teamgym, Sport Injuries

1. INTRODUCTION

The elite gymnasts seriously start their training at the age of 6 or earlier. At their later ages, they increase the levels, frequencies and intervals of their training. The training period with high frequency and interval brings injury risks inevitably. The injuries related to the overuse after stress and micro traumas are the most important injuries in the World of sports (Biçer et al 2009). Furthermore the gymnasts have tendency to carry out their training and competition although they suffer from pain and injuries (Harringe et al 2008). For the reason the gymnast can not finish their sports life without suffering from pain and injuries at training and competitions (Caine and Nassar 2015).

Trampoline gymnastics and team gym are well known and popular sports throughout Scandinavian countries. Team gym is especially Scandinavian originated form new and popular sport (Harringe et al 2007). The parts of the team gym consists of trampoline, mini trampoline and floor gymnastic (Harringe et al 2007). The artistic gymnastic indicates some differences for male and female gymnast in some parts but no difference in team gym (Harringe et al 2007). The first european championship was held in Finland in 1996. Power tumbling is an acrobatic sports discipline that forms from the combination of some skills taken from

artistic gymnastic and trampoline. At the power tumbling male and female gymnasts display their performance on the floor, big trampoline and double mini trampoline.

The Ollerup gymnastic High school which is the oldest sports school in Denmark was established by Danish trainer Niels Bukh in 1920. The school serves to the Danish gymnasts as well as other gymnasts coming from different parts of the World. Among these gymnasts there are gymnasts in their National teams. In this study it is aimed to evaluate the sports injuries of the gymnasts who perform power tumbling, team gym and performance gymnasts attending to Ollerup gymnastic High school.

2. MATERIAL AND METHOD

This study was carried on 39 gymnast 9 of whom are female and 30 of whom are male attending to the Ollerup gymnastic High School in 2014-2015 academic year. During the development of information and questionnaire form the help of academic staff, physiotherapist and trainers was taken. Then, the injury cases of the gymnasts were determined by developing information and questionnaire form consisted of 24 questions. The obtained data was analysed by using SPSS 22 packed

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program. The descriptive statistics of the gymnasts are tabled as frequency, average, standard deviation, standard mistake and percentage.

3. FINDINGS

The age, height and weight averages of the gymnasts attending to the Ollerup gymnastic High School in

2014-2015 academic year are $20,87 \pm 1,86$, $176,78 \pm 10,86$ cm, $72,72 \pm 10,79$ kg consecutively. The obtained data related to the injury cases of the gymnasts are evaluated statistically and the values are tabled as frequency, average, standard deviation, standard mistake and percentage.

Table 1. The distribution of injury cases of gymnasts related to the season

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Preparatory Period	32	58,2	59,3	59,3
	Competition Period	20	36,4	37,0	96,3
	Rest Period	2	3,6	3,7	100,0
	Total	54	98,2	100,0	
Missing	System	1	1,8		
Total		55	100,0		

Table 2. The distribution of injury cases of gymnasts related to the body parts

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Head	2	3,6	3,6	3,6	
	Neck	1	1,8	1,8	5,5	
	Face	1	1,8	1,8	7,3	
	Shoulder	1	1,8	1,8	9,1	
	Chest and Abs	1	1,8	1,8	10,9	
	Arms	3	5,5	5,5	16,4	
	Hand and Wrist	4	7,3	7,3	23,6	
	Lower Back	9	16,4	16,4	40,0	
	Thigh	1	1,8	1,8	41,8	
	Knee	2	3,6	3,6	45,5	
	Calf	3	5,5	5,5	50,9	
	Feet and Ankle	26	47,3	47,3	98,2	
	Other	1	1,8	1,8	100,0	
	Total		55	100,0	100,0	

Table 3. The distribution of injury cases of gymnasts related to the types of injury

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Broken	3	5,5	5,5	5,5	
	Dislocation	4	7,3	7,3	12,7	
	Crack	1	1,8	1,8	14,5	
	Tension	10	18,2	18,2	32,7	
	Twist	20	36,4	36,4	69,1	
	Crushed	2	3,6	3,6	72,7	
	Rupture	4	7,3	7,3	80,0	
	Shin Split	1	1,8	1,8	81,8	
	Other	10	18,2	18,2	100,0	
	Total		55	100,0	100,0	

Table 4. The reasons of injuries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mental Factors	8	14,5	14,5	14,5
	Overload	24	43,6	43,6	58,2
	Inadequate Training	3	5,5	5,5	63,6
	Malnutrition	4	7,3	7,3	70,9
	Inadequate equipment	1	1,8	1,8	72,7
	Other reasons	15	27,3	27,3	100,0
	Total	55	100,0	100,0	

Table 5. The distribution of treatment methods

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rest	23	41,8	41,8	41,8
	Physiotherapy	18	32,7	32,7	74,5
	Surgery	7	12,7	12,7	87,3
	Spontaneously recovered	2	3,6	3,6	90,9
	Chronic	5	9,1	9,1	100,0
	Total	55	100,0	100,0	

Table 6. The recovery period

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than one day	2	3,6	3,7	3,7
	48-72 hours	2	3,6	3,7	7,4
	3-7 days	1	1,8	1,9	9,3
	1-2 weeks	10	18,2	18,5	27,8
	2-4 weeks	11	20,0	20,4	48,1
	1-2 months	11	20,0	20,4	68,5
	2-4 months	8	14,5	14,8	83,3
	More than 4 months	9	16,4	16,7	100,0
	Total	54	98,2	100,0	
Missing	System	1	1,8		
Total		55	100,0		

Table 7. The distribution of injury related to the equipment used at the beginning of the skill

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	air track	7	12,7	18,4	18,4
	fast track	3	5,5	7,9	26,3
	road floor	6	10,9	15,8	42,1
	Big trampoline	4	7,3	10,5	52,6
	Mini trampoline	9	16,4	23,7	76,3
	pegasus	1	1,8	2,6	78,9

	Floor	8	14,5	21,1	100,0
	Total	38	69,1	100,0	
Missing	System	17	30,9		
Total		55	100,0		

Table 8. The distribution of injury related to the equipment used at the end of the skill

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Crash Mat	8	14,5	30,8	30,8
	Foam Pit	5	9,1	19,2	50,0
	Trampolin Pit	9	16,4	34,6	84,6
	Floor	3	5,5	11,5	96,2
	Other	1	1,8	3,8	100,0
	Total	26	47,3	100,0	
Missing	System	29	52,7		
Total		55	100,0		

4. DISCUSSION AND RESULT

In this study, it is aimed to evaluate the injuries of power tumbling, team gym and performance gymnasts training at the Ollerup gymnastic High School.

At the end of the study it is determined that the distribution of the injuries in the season occurred %58,2 at the preparation period, %36,4 at the competition and %3,6 at the rest periods. In the literature it seen that, the number of injuries increase in the period just before the competition periods when the training rate decreases (Caine et al 1989; Caine et al 2003; Kerr and Minden 1988). The injuries which recovery period takes a long time are seen among the beginners rather than training period and elite gymnasts (Caine et al 1989; Caine et al 2003; Kolt and Kirkby 1995; Kolt and Kirkby 1999).

When the injuries are evaluated, it is clear that feet and ankle injuries are %47,3 and lower back is %16,4. In the study carried out at Ohio Cleveland Clinic Sports Health Center, it is found out that lower extremity injuries are at high rate than upper extremity injuries (Saluan et al 2015). In the same study, feet and ankle injuries are at the highest rate with the rate %33,3 among the total injuries (Saluan et al 2015). The study carried out by C.Bolling and M.Leite between the difference of the injuries on artistic gymnastic and trampoline gymnastic injuries proved that lower extremity injuries, especially periostitis, occurred in trampoline gymnastic. Furthermore lower back injuries are at a high rate caused by the respective micro traumas because of repetitive jumps (Bolling and Leite 2012). M.L harringe 2007 claimed that the athletes in teamgym had lower extremity injuries with %62 rate and most common of such injuries is twisted ankle (Harringe et al 2007). The results of other studies supported the results of our study.

When the type of the injuries investigated, it is seen that twists are at %36,4 and tension is at %18,2 rates. At the study carried on Ohio Cleveland Clinic sports health center twists and tension cases covered %27,7 portion of the total injuries (Saluan et al 2015).

When the gymnasts were asked the reason of their injuries they claimed that the reason of their injuries related to the %43,6 were overload, %27,3 other reasons and %14,5 mental reasons.

When the injuries evaluated related to the treatment methods resting rate was %41,8, physiotherapy was %32,7 and surgery was %12,7.

It is seen that the recovery period of 1-2 weeks is at the rate of %18,2, 2-4 weeks at %20 rate, 1-2 months at %20 rate, 2-4 months at %14,5 and more than 4 months at %16,4.

The distribution of the injury related to the the equipment at the beginning of the skill is %16,4 mini trampolin, %14,5 is floor and %12,7 is air track. It is thought that the reason why the injuries occurred on the mini trampoline at a high rate is that the athlete overloads his ankle and knee joints at the wrong method applications and the angle of the athletes jump into the mini trampoline is opposite to the trampoline.

The distribution of the injury related to the the equipment at the end of the skill is %16,4 trampolin pit, %14,5 crash mat. The skills including twists at the crashing point, most of the injuries occurred on knee and ankles because of the crashing of the athletes on the trampoline pit without stopping the momentum coming from the twist. The reason why the rate of The ankle injuries both occurred for the first time and

happened before and repetitive was at the high rate can be caused because of the crashing from the high distance after twist and rotation of the gymnasts (Marshall et al 2007). Hyperflexion of the ankle observed during the uncompleted back somersault can cause twists and tearing of the ligaments (Graption et al 2012). Such a case can be a reason for injuries occurred on trampoline pit. If the comparison made for the injury rates between foam pit and trampoline pit in Table 8, it can be seen that the table supports such a case. The crashings made without applying the crashing technique and momentum at the end of the skill lead to shock to the joints at a high rate because of the toughness of the crash mat. Such a case can be used to explain the rate of the crash mat to the injuries.

As a result, this study can give some suggestions for the further studies to the trainers and gymnasts who perform trampoline gymnastics about training intensities, physical fitness of the gymnasts, the precautions against injuries, decreasing the number of injuries and finding out the reasons of the injuries.

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