ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

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The Investigation of History of Sports Injury and the Level of Anxiety of Sports Injury in Elite Wrestlers: Descriptive Research

Elit Güreşçilerde Spor Yaralanma Öyküsü ve Spor Yaralanma Kaygı Düzeylerinin Araştırılması: Betimsel Araştırma

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ABSTRACT Objective: The purpose of the study was to investigate the sports injury history that occurred during the competition and the training, and anxiety of sports injury in elite wrestlers. **Material and Methods:** This study was conducted a total of 172 who young wrestlers including 72 females (age: 19±0.85 years; height: 167.83±4.18 cm; body mass: 67±9.58 kg) and 100 males (age: 19±0.83 years; height: 176.92±7.91 cm; body mass: 73±13.32 kg). Ethics committee approval was obtained before the study. In this study, as a data collection tool was used the Sports Injury Anxiety Scale and athlete information form including training experience, wrestling style, the environment in which the injury occurred, rapid weight loss, injured region, etc. As statistical analysis one-way ANOVA test was used for independent groups and Pearson correlation. **Results:** The study results demonstrated that female wrestlers had higher injury rates including shoulder and elbow and forearm compared to male wrestlers and male freestyle wrestlers had higher anxiety levels for experiencing pain and re-injury anxiety levels compared to female wrestlers ($p<0.05$). It was found that the rapid weight loss was performed at the rate of 98.6% and 85% in female and male wrestlers respectively. There was a weak negative correlation was seen between the number of weight loss and the experiencing pain ($p<0.05$). **Conclusion:** These results confirmed that freestyle wrestlers experienced the anxiety level more than female and Greco-Roman wrestlers.

Keywords: Anxiety; injury; wrestling; gender

ÖZET Amaç: Bu çalışmanın amacı, elit güreşçilerde müsabaka ve antrenman esnasında meydana gelen spor yaralanma öykülerinin ve yaralanma kaygı düzeylerinin incelenmesidir. **Gereç ve Yöntemler:** Bu araştırmaya 72 kadın (yaş: 19±0,85 yıl; boy uzunluğu: 167,83±4,18 cm; vücut ağırlığı: 67±9,58 kg) ve 100 erkek (yaş: 19±0,83 yıl; boy uzunluğu: 176,92±7,91 cm; vücut ağırlığı: 73±13,32 kg) olmak üzere toplam 172 sporcu katılmıştır. Araştırma öncesi etik kurul izni alınmıştır. Veri toplama aracı olarak Spor Yaralanmaları Kaygı Ölçeği ile antrenman deneyim süresi, güreş stili, yaralanmanın meydana geldiği ortam, hızlı kilo kaybı, yaralanma bölgesi gibi soruları içeren bilgi formu kullanılmıştır. İstatistiksel analiz olarak bağımsız gruplar için tek yönlü ANOVA testi ve Pearson korelasyon testi kullanılmıştır. **Bulgular:** Bu araştırmada, kadın güreşçilerin erkek güreşçilere göre omuz, dirsek ve ön kol yaralanma oranlarının daha yüksek olduğu ve erkek serbest stil güreşçilerin kadın güreşçilere oranla acı çekme ve yeniden yaralanma kaygı düzeylerinin daha yüksek olduğu görülmektedir ($p<0,05$). Hızlı kilo kaybının kadın ve erkek güreşçilerde sırasıyla %98,6 ve %85 oranında olduğu belirlenmiştir. Acı çekme kaygısı ile kilo kaybı sayısı arasında zayıf negatif korelasyon bulunmuştur ($p<0,05$). **Sonuç:** Sonuç olarak serbest stil güreşçilerin kadın ve Greko-Romen güreşçilere göre kaygı seviyelerinin daha fazla olduğunu göstermektedir.

Anahtar Kelimeler: Anksiyete; yaralanma; güreşçi; cinsiyet

Sports injuries are defined as a problem that occurred during sportive activities or after, which cause a decrease in the frequency and intensity of activity, requiring medical treatment, with social and psychological effects.[1,2] No matter what sports branch, it is possible that all athletes actively doing sports experience serious or not important injuries. Different injuries can be seen on different body parts based on the implemented sports. Some factors causing sports injuries are such as spending time in competition and training, the player's technique, his/her training methods, the training facility conditions, and the use of

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mats and protective equipment.[3,4] In recent years, the literature reported that factors such as anxiety, stress, and motivation had affected both success and the rate of injury.[5-9] Another important factor causing sports injuries is the type of sports. Wrestling which is one of the most challenging sports that require the use of all body members together is accepted as a branch in which athletes need both the most level of physical fitness and talent and have to sustain mental endurance.[4,10]

Olympic style wrestling consists of freestyle and Greco-Roman, each of which has different rules and technique. One of these is called free-style wrestling which requires using all body parts. The other one is called Greco-Roman wrestling. While freestyle wrestling allows using all body parts, Greco-Roman style which is performed only in the upper body is not allowed to lower body.[11] The sports which require the using all body parts such as combat or contact sports, increase the risk of injuries.[2] For the reason, wrestling is one of the sports with the highest risk of getting injured.[10] Wrestlers use their whole bodies to struggle with their opponent in a wrestling match. Bio-mechanic forces cause injuries in different body parts and tissues during this process.[12] A study conducted on wrestling injuries reported that out of 1,000 training or competition, 69.5% experience injuries.[4]

In Beijing 2008 Olympic games, it was stated that the wrestlers of 343 who took part in 406 wrestling matches, got injured 9.3% of them. In a literature study, the injury rate per 100 athletes is indicated at 7.9 per 100 matches.[2] In addition, it has been reported that uncontrolled power, aggression, and risky behaviors of athletes in cases of high anxiety and depression levels also cause injuries.[13] Anxiety is expressed as a situation of fear and tension that can be observed frequently in the daily behavior of individuals, negatively affecting the athlete's performance.[5,14] Although some researchers have indicated that athletes with high level of anxiety are more likely to suffer more severe injuries than athletes with lower levels, others have shown no association between sports injury and anxiety.[15,16]

In the prevention of injuries, it is important to determine psychological conditions along with individual and environmental protective measures and to the best of our knowledge, the lack of enough study was seen on the sports injury anxiety scale in wrestlers. Accordingly, the aim of this study firstly a) was to determine the injuries that occurred during the training or the competition based on injury history obtained by self-report, secondly, b) to examine the injury anxiety according to the sub-dimension between female and male wrestlers. It was hypothesized that male wrestlers had higher injury rates and anxiety levels compared to female wrestlers.

MATERIAL AND METHODS

RESEARCH GROUP

The study was conducted a total of 172 young wrestlers including 72 females (age: 19±0.85 years) and 100 males (age: 19±0.83 years). The data was collected on February 2020. The study was carried out in accordance with the Helsinki Declaration and prior to this study, the ethics committee approval was obtained from the Hitit University Non-Invasive Research Ethics Committee (date: February 27, 2020, no: 2020-21). The consent form was signed by the participants before the study.

DATA COLLECTION

In this study, as a data collection tool, it was used the Sports Injury Anxiety Scale and athlete information form, and data were collected by questionnaire method.

ATHLETE INFORMATION FORM

Athlete information form included that age, gender, height, training experience (year), education, wrestling style, best achievement, the environment in which the injury occurred, regular health control, rapid weight loss, adaptation to the post-injury sportive rehabilitation process, ability to continue in case of injury, injured region, duration of inability to participate activity because of injury etc.

SPORTS INJURY ANXIETY SCALE

Sports Injury Anxiety Scale developed by Rex and Metzler (2016) and by adapting by Caz et al. to Turkish, validity-reliability study was carried out. The scale has five likert gradings. It comprises 6 sub-di-

mension and 19 questions. There are no reverse-coded items on the scale. A high mean score shows high-level anxiety. The lowest score can be obtained from the scale is 19, and the highest score is 95. The Cronbach's alpha internal consistency coefficient for the Sports Injury Anxiety Scale was found at 0.870.[14]

STATISTICAL ANALYSIS

As descriptive statistics in the analysis of quantitative data were used frequency, percentage, mean, standard deviation, minimum, and maximum values. The data were determined normally distributed with Shapiro-Wilk test and one-way ANOVA test was used between more than 2 independent groups. To determine differences between groups, Tukey test was used as post-hoc analysis. As correlation analysis was used Pearson correlation analysis. IBM SPSS 25 (ABD) licensed package program was used in the analysis of the data. The level of significance in the analysis was determined as $p<0.05$.

RESULTS

When the characteristic features related to the subject were investigated in Table 1, the training experience indicated for the female and male wrestlers 7.0±2.13 and 7.0±2.47 year respectively. The number of weight loss (year) was seen 4.0±0.79 and 3.0±1.55 respectively in female and male wrestlers. The average weight loss was seen 6.0±1.85 and 6.0±2.95 respectively in female and male wrestlers.

Table 2 presents the average of the multidimensional sports injury anxiety sub-dimension of the participants is 2.56±0.77, the average of the being perceived losing athletic ability was 2.24±1.07, the average of the experiencing pain sub-dimension was 3.54±1.08, the average of the letting other down sub-dimension was 2.39±1.25, the average of the losing social support 1.62±0.87, the average of the re-injury sub-dimension was 3.35±1.08.

When the variables related to the subject were investigated in Table 3, it showed that the injury occurred by contact found 43.1% and 43% in female and male wrestlers respectively. The time away from competition or training was seen mostly in the range of 1 and 7 days and 44.4% and 51% respectively in female and male wrestlers. According to the body parts that were injured, in all wrestlers, mostly shoulder, knee and, elbow-forearm was seen the rate of 40.3%, 44.4%, and 38.9% in female respectively, it was the rate of 32%, 54%, and 28% respectively in males. As the environment that was occurred injury, it was seen in female and male the rate of 62.5% and 65% respectively during the training. It was found that the rapid weight loss was performed at the rate of 98.6% and 85% in female and male wrestlers respectively.

Table 4 presents, when examined the correlation levels among all variables a weak negative correlation was only seen between the number of weight loss and the experiencing pain ($p<0.05$).

Table 5 presents the anxiety level of wrestlers according to the wrestling styles. When the sub-dimensions of the anxiety scale were examined, it was found a statistically significant difference in the experiencing pain between freestyle and Greco-Roman ($p<0.05$). The freestyle wrestlers compared to the Greco-Roman wrestlers had statistically higher mean

TABLE 1: The characteristic features of wrestlers according to the genders.

	Female (n=72)		Male (n=100)	
Variables	**$\bar{X}$±SD**	**Minimum-maximum**	**$\bar{X}$±SD**	**Minimum-maximum**
Age (year)	19.0±0.85	18-20	19.0±0.83	18-20
Training experience (year)	7.0±2.13	4-12	7.0±2.47	4-11
Body height (cm)	167.83±4.18	160-179	176.92±7.91	162-188
Body mass (kg)	67.0±9.58	50-82	73±13.32	57-130
Number of weight loss (year)	4.0±0.79	0-6	3.0±1.55	0-5
Average weight loss	6.0±1.85	0-11	6.0±2.95	0-11

SD: Standard deviation.

TABLE 2: Descriptive analysis of participants' anxiety responses.

Sub-dimensions (n=172)	$\bar{X}$±SD	Minimum-maximum
Losing athletic ability	2.24±1.07	1-5
Being perceived as weak	1.98±0.96	1-5
Experiencing pain	3.54±1.08	1-5
Letting other down	2.39±1.25	1-5
Losing social support	1.62±0.87	1-5
Re-injury	3.35±1.08	1-5
Total	2.56±0.77	1-4.79

SD: Standard deviation.

experiencing pain values. At the re-injury sub-dimension, it was found that freestyle wrestlers had statistically more mean values than female wrestlers ($p<0.05$).

DISCUSSION

The first part of the discussion refers to the injury region, injury with contact or not, the time loss from the injury, and where the injury occurred. This is followed by evaluating the sub-dimension of anxiety injury, and the relationship with some of the variables and the sub-dimension. The study findings firstly indicated that female and male wrestling injuries found similar injury rates and patterns between the genders. The injury patterns were seen in the study with large rates of the knee, shoulder, elbow, and forearm for both genders, but male wrestlers had higher injury rates knee, back and neck region than female wrestlers (Table 3). The higher prevalence of shoulder, elbow and forearm injuries among female

TABLE 3: The descriptive features of wrestlers according to the genders.

		Female		Male	
Variable	Group	f	%	f	%
Education	High school	42	58.3	52	52
	University	30	41.7	48	48
Wrestling style	Freestyle	-	-	71	71
	Greco-Roman	-	-	29	29
	Women style	72	100	-	-
Best achievement	National	52	72.2	83	83
	International	20	27.8	17	17
Regular health control	Yes	39	54.2	54	54
	No	33	45.8	46	46
Duration of inability to participate sportive activity	0	11	15.3	10	10
	1-7	32	44.4	51	51
	8-21	20	27.8	21	21
	21 and higher	9	12.5	18	18
Injury by contact	Yes	31	43.1	43	43
	No	41	56.9	57	57
Injury region	Shoulder	29	40.3	32	32
	Knee	32	44.4	54	54
	Back	4	5.6	8	8
	Elbow and forearm	28	38.9	28	28
	Hand	18	25.0	22	22
	Neck	3	4.2	8	8
Rehabilitation	Yes	36	50.0	55	55
	No	22	30.6	15	15
	Not least	14	19.4	30	30
Injury environment	Training	45	62.5	65	65
	Competition	27	37.5	35	35
Rapid weight loss	Yes	71	98.6	85	85
	No	1	1.4	15	15

TABLE 4: The correlation between training experience, body mass, and rapid weight loss and the level of sports injury anxiety.

Variable	Dimension	Losing athletic ability	Being perceived as weak	Experiencing pain	Letting other down	Losing social support	Re-injury
Training experience	Correlation	0.066	0.070	-0.019	-0.124	0.099	-0.044
	p value	0.392	0.361	0.805	0.106	0.195	0.570
Body mass	Correlation	0.000	-0.119	-0.056	0.099	-0.120	-0.018
	p value	0.996	0.120	0.467	0.195	0.116	0.818
Number of weight loss	Correlation	0.082	-0.031	-0.154*	0.115	0.093	-0.060
	p value	0.282	0.690	0.044	0.133	0.226	0.434

*p<0.05.

TABLE 5: The sub-dimensions of injury anxiety according to the wrestling styles.

Dimension	Wrestling style	f	$\bar{X}$	SD	df	F	p value	Difference
Losing athletic ability	Male freestyle	71	2.31	1.08	2-169	0.516	0.598	
	Male Greco-Roman	29	2.31	1.00				
	Female wrestlers	72	2.14	1.10				
Being perceived as weak	Male freestyle	71	2.08	0.91	2-169	0.720	0.488	
	Male Greco-Roman	29	1.87	0.94				
	Female wrestlers	72	1.92	1.03				
Experiencing pain	Male freestyle	71	3.73	0.99	2-169	3.306	0.039*	1>2
	Male Greco-Roman	29	3.12	1.21				
	Female wrestlers	72	3.52	1.08				
Letting other down	Male freestyle	71	2.42	1.24	2-169	0.399	0.671	
	Male Greco-Roman	29	2.54	1.31				
	Female wrestlers	72	2.30	1.24				
Losing social support	Male freestyle	71	1.70	0.90	2-169	1.039	0.356	
	Male Greco-Roman	29	1.70	1.03				
	Female wrestlers	72	1.50	0.76				
Re-injury	Male freestyle	71	3.62	1.01	2-169	3.953	0.021*	1>3
	Male Greco-Roman	29	3.24	1.14				
	Female wrestlers	72	3.13	1.07				

*p<0.05 SD: Standard deviation; df: Degree of freedom.

wrestlers seen in this study likely may stem from the weak joint structure than male wrestlers that lead to disposition of injury and because of this reason could increase the frequency of injuries in female wrestling. Jansson et al. reported that a higher degree of general joint laxity was seen in girls compared to boys of all ages.[17] The situation could be led to more flexibility in ligamentous strength and laxity, which could make the ligaments more predisposed to becoming injured.[18] The study conducted by Hoge et al. compared the injuries that occurred in male and female wrestlers.[18] The study findings showed that the most common body regions were head/neck, shoulder, and knee for both genders. However, they stated that male wrestlers had significantly higher proportions (male: 24.6%, female: 18.5%) of head and neck injuries than female wrestlers, the other body regions including shoulder, knee, elbow, were a similar rate of injuries with females. Yard and Comstock conducted a study that consisted of Cadet and Junior National Championships on freestyle and Greco-Roman wrestlers.[19] They reported that most commonly occurred head/face/neck (31.9%), shoulder/clavicle (21.7%), and knee (14.5%) injuries.

According to the injury patterns, it indicated that mostly for freestyle was seen the lower extremity injuries, for Greco-Roman wrestlers was seen head/face/neck injuries. In a study conducted by Yard et al., the research findings indicated that the most common high school injury sites were the shoulder (18.6%) and knee (15.4%), while in college wrestlers were the knee (24.8%), shoulder (17.8%), and head/face (16.6%).[20] In another study, Pasque and Hewett monitored the injuries that occurred in a high school wrestling population during an entire season.[21] They found that the most commonly injured body parts were found as the shoulder (24%) and knee (17%) and where occurred the majority of injuries were in wrestling training (63%) by the average time lost from injury was 5 days. In our study, the findings showed that the time loss from competition or training was mostly in the range of 1 and 7 days and 44.4 % and 51% respectively in female and male wrestlers (Table 3). Agel et al. stated that the injuries that occurred resulted in at least 10 day time loss in restriction for the competition (the rate of injuries occurred 34%) and wrestling training (the rate of injuries occurred 28%) participation.[22] Our study results determined that the injuries that occurred in female and male wrestlers during the training were seen at the rate of 62.5% and 65% respectively, the other occurred in competitions. Halloran reported that most percentages of the injuries were related to direct contact between wrestlers during takedown (43%).[23] In our study findings (injury by contact found 43.1% and 43% in female and male wrestlers respectively) were consistent with this study's results (Table 3). Grindstaff and Potach stated that the most injury regions were the knee, face, shoulder, ankle, and neck, in which most injuries occurred because of the result of contact with a competitor or mat or twisting forces.[3] Agel et al. reported that most of the injuries in competition and in wrestling training resulted from the opponent contact (55.0% and 63.6% respectively), whereas another contact such as mat accounted for 22.9% of injuries.[22]

Another important finding in this study was the rapid weight loss that performed at the rate of 98.6% and 85% in female and male wrestlers respectively (Table 3). Castor-Praga et al. found that 96% of wrestlers and taekwondo athletes reported the use of strategies for rapid weight loss.[24] The rapid weight loss situation that may be led to increased occurring injuries for the wrestlers, is one of the primary problems that are difficult to prevent.[24,25] A study conducted by Pedro and Martins consisted of a total of 77 injuries were reported by the 35 wrestlers via to self-report "Athletes Engagement Questionnaire".[2] They reported that 32.1% of injuries occurred in stressful periods, but 25.9% of injuries occurred in weight loss periods, in addition, the results were more evident for seniors (42.9%) and cadets (44.4%). The study findings that related to correlation analysis with the sub-dimensions of injury anxiety shows that between the number of weight loss and the experiencing pain are seen a negative weak correlation (Table 4). Based on this finding, it suggests that as the rapid weight loss number rising may lead to result the desensitization against experiencing pain.

In addition to this finding, the study findings indicated that there was no correlation between sports age and body weight the injury anxiety scale sub-dimension (Table 4). When the literature study findings were examined, it was seen to be difficult to compare the findings directly with the literature findings, because of the lack of findings directly related to our findings. However, similar study findings showed that the losing athletic ability sub-dimension, and the re-injury sub-dimension increased as the higher age of training experience.[13,26] Another study conducted by Kayhan et al. stated that athletes who had the range of 4 and 6 years of sports experience, had a higher mean of the being perceived sub-dimension as weak compared to athletes who participated in sports for more than 10 years.[8]

The reason for the difference between our study's findings and literature may be derived from sports type and age mean. No matter what for athletes, sports support the culture of winning and competition. Therefore, it is stated that athletes having high and continuously anxiety level have experienced more anxiety, especially in challenging competitions. It is known that as the anxiety level of the athlete increases, the sportive success is negatively affected.[7,27] A study investigating the athletes' anxiety levels engaged individual and team sports conducted by

Karayol and Yavuz-Eroğlu, indicated that the athletes who engaged in team sports had higher anxiety score than individual sports.[28]

In our study, the findings indicated that the level of experiencing pain anxiety was higher in freestyle wrestlers, compared to the Greco-Roman ($p<0.05$) and female wrestlers ($p>0.05$) (Table 5). The reason for it may be that freestyle wrestling allows contacting all body parts, therefore they may be moving to protect themselves against injury under higher stressful conditions. In addition, the other reason may be the number of participating in wrestling styles. Because, based on our assumption, it could be seen that the participation of freestyle wrestling in competitions were higher rates than the other styles such as Greco-Roman and female wrestling. Besides, the study findings showed that the sub-dimension of re-injury anxiety in freestyle wrestlers was higher than female wrestlers ($p<0.05$) (Table 5). The literature studies related to anxiety indicated no significant differences in the re-injury anxiety sub-dimension between the genders, the athletes who engaged individual and team sports, and the badminton players under the age of seventeen.[26,28,29] Tanyeri reported that the anxiety levels of male athletes, including losing athletic ability, letting others down, losing social support in sub-dimension, had higher compared to female athletes, but the other sub-dimensions were not similar levels. In view of this, the results inconsistent with each other generally were seen in literature studies, some researchers stated that there weren't significant differences in injury anxiety sub-dimension, and some researchers also reported the males had higher anxiety scores.[30]

In our study, the reason for the high scores of experiencing pain and re-injury sub-dimension, it was thought that male freestyle wrestlers would be interfered with more harshly their rivals physically compared to female wrestlers. One of the important factors could be the pain threshold against the injury. The pain threshold level between the genders may be different and it may affect the results. Besides, the other factor may be the higher population of male wrestlers, injury rates, age mean of athletes and, because of the characteristics of the sample group.

CONCLUSION

Female wrestlers had higher injury rates except for knee, back, neck region compared to male wrestlers. Besides, freestyle wrestlers had higher anxiety levels compared to female wrestlers, especially for experiencing pain and re-injury sub-dimension of anxiety levels. Therefore, we suggest that male wrestlers may be required more psychological support than female wrestlers. Besides, the injury pain threshold between the genders may be researched in future studies.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Onur Bayındır, Sema Can, Erkan Demirkan;* ***Design:*** *Onur Bayındır, Sema Can, Erkan Demirkan;* ***Control/Supervision:*** *Onur Bayındır;* ***Data Collection and/or Processing:*** *Onur Bayındır;* ***Analysis and/or Interpretation:*** *Sema Can, Erkan Demirkan;* ***Literature Review:*** *Onur Bayındır;* ***Writing the Article:*** *Onur Bayındır, Sema Can, Erkan Demirkan;* ***Critical Review:*** *Erkan Demirkan.*

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