

ORIGINAL ARTICLE
SPORT INJURIES AND REHABILITATIONIncidence of injuries and associated risk factors
in a sample of Italian recreational padel playersEwan THOMAS ¹, Valerio GIUSTINO ¹, Emanuele FERRISI ¹, Antonino PATTI ¹ *,
Massimo CASSARINO ², Patrik DRID ³, Antonino BIANCO ¹¹Sport and Exercise Sciences Unit, Department of Psychology, Educational Science and Human Movement, University of Palermo, Palermo, Italy; ²Centro Spalla Sicilia, Gela, Caltanissetta, Italy; ³Faculty of Sport and Physical Education, University of Novi Sad, Novi Sad, Serbia*Corresponding author: Antonino Patti, Sport and Exercise Sciences Unit, Department of Psychology, Educational Science and Human Movement, University of Palermo, Via Giovanni Pascoli 6, 90144 Palermo, Italy. E-mail: antonino.patti01@unipa.it

ABSTRACT

BACKGROUND: Padel is a racket sport similar to tennis, which since the COVID-19 pandemic has been gaining popularity among recreational players. Despite its popularity, epidemiological studies are still lacking. This study aimed to identify the prevalence of injuries among Italian recreational padel players and associated risk factors.**METHODS:** A questionnaire was administered to 127 recreational padel players between January 2022 to March 2022. The questionnaire consisted of questions to collect information regarding intrinsic and extrinsic factors related to padel practice, injury location, and injury typology. Frequencies and proportions were calculated for variable description. Binomial logistic regression was adopted to identify potential risk factors. **RESULTS:** Of the 127 participants, 100 (78.8%) reported having had an injury during the previous year. Such injury in most cases (37%) resulted in an absence from padel from 8 to 28 days. The most common injury locations were lower leg/Achilles tendon (17.1%) and elbow (13.8%), while the most common injury typologies were tendinopathies (33.6%) and contusions (14.9%). Among the identified risk factors the amount of time played padel (3.5-5 hours/week), racket type (round), and racket weight (either not knowing or 356-375 g) resulted in an increase in the probability of occurring an injury.**CONCLUSIONS:** Recreational padel results in a high percentage of injuries. These frequently result in tendinopathies of the Achilles tendon and elbow. Inadequate racket characteristics and the amount of time played could contribute to an increase in injury incidence.*(Cite this article as: Thomas E, Giustino V, Ferrisi E, Patti A, Cassarino M, Drid P, et al. Incidence of injuries and associated risk factors in a sample of Italian recreational padel players. J Sports Med Phys Fitness 2023;63:000-000. DOI: 10.23736/S0022-4707.23.15221-2)***KEY WORDS:** Wounds and injuries; Risk factors; Epidemiology.

Padel is a double racket sport born in Mexico in 1962¹ that has become very popular in Spain during the last decades² and has increased its popularity in other countries during the COVID-19 pandemic. Since then, the interest of the scientific community has grown with numerous investigations that have evaluated different aspects of this sport. These range from those related to performance,³ biomechanics,⁴ injury incidence,⁵ injury prevention,⁶ and technical aspects.⁷ Despite the similarities to other racket sports, there are significant differences in terms of performance pattern⁸ as the court differs from that of tennis, table tennis, badminton, or squash.^{2, 4} Padel is the only

racket sport that has a court surrounded by walls on which players can bounce the ball, which results in a very fast pace of play.⁶ Furthermore, substantial differences can be observed in the racket used which is a short-handed pad racket of different shapes with a foam core and an outer shell which can be made of carbon, fiberglass, graphite, or other solid materials.⁹ These peculiar characteristics and the high playing intensity attributed to padel¹⁰ can lead to specific injury patterns. Previous studies evaluating the epidemiology of injuries in padel^{5, 6, 11-13} generally agree that there is a high rate of injuries, especially in recreational players. Regarding injury location, differences emerge

TABLE II.—*Injury type and location of the participants.*

Parameters	N. total	%
Injured (N. of participant)		
Yes	100	
No	27	
Return to play		
<1 day	10	
1-3 days	12	
4-7 days	20	
8-28 days	37	
>28 days	21	
Total N. of injuries (N./%)	181	100
Location (N. of injuries)		
Head and neck	10	5.5
Head/face	7	3.9
Neck/cervical spine	3	1.7
Upper limb	66	36.5
Shoulder/clavicle	15	8.3
Upper arm	8	4.4
Elbow	25	13.8
Forearm	4	2.2
Wrist	9	5.0
Hand/finger/thumb	5	2.8
Trunk	12	6.6
Sternum/ribs/upper back	2	1.1
Abdomen	0	0.0
Lower back/pelvis/sacrum	10	5.5
Lower Limb	93	51.4
Hip/groin	6	3.3
Thigh	11	6.1
Knee	16	8.8
Lower leg/Achilles tendon	31	17.1
Ankle	15	8.3
Foot/toe	14	7.7
Typology		
Bone	16	8.8
Fracture	3	1.7
Other bone injury	13	7.2
Joint and ligament	34	18.8
Dislocation/subluxation/instability	10	5.5
Ligament injury	10	5.5
Lesion of meniscus/articular cartilage	10	5.5
Synovitis	4	2.2
Muscle and tendon	76	42.0
Muscle rupture/tear/spasm/cramp	15	8.3
Tendon tear/tendinopathy/bursitis	61	33.6
Skin	45	24.8
Hematoma/contusion/bruise	27	14.9
Abrasion/laceration	18	9.9
Central/peripheral nervous system	5	2.8
Other	5	2.8

The injuries of the “central/peripheral nervous system” and “other”, under “typology”, refer to injuries of nerves, eyes and teeth.

TABLE III.—*Comparison of injury risk factors between injured and non-injured participants.*

Parameters	Injured		Non-injured		P	OR	CI
	N.	%	N.	%			
Gender							
Man	72	72	22	81.5	0.305	1.71	0.59-4.96
Women	28	28	5	18.5		0.58	0.20-1.69
Age							
18-35	18	18	4	14.8	0.614	1.22	0.03-2.10
36-50	55	55	15	55.6		0.81	0.24-2.77
51-65	25	25	6	22.2		0.92	0.22-3.77
>65	2	2	2	7.4		0.22	0.02-2.09
Handedness							
Right	91	91	26	96.3	0.553	2.29	0.27-19.12
Left	9	9	1	3.7		0.44	0.05-3.66
Residence							
North Italy	26	26	9	33.3	0.332	0.87	0.33-2.31
Center Italy	46	46	14	51.9		1.14	0.43-2.99
South Italy	28	28	4	14.8		2.42	0.66-8.83
Experience							
<1 year	33	33	11	40.7	0.427	1.80	0.69-4.67
1-3 years	54	54	10	37.0		0.56	0.21-1.45
4-5 years	6	6	3	11.1		2.70	0.57-12.6
>5 years	7	7	3	11.1		2.31	0.51-10.49
Padel physical training							
Yes	16	16	4	14.8	0.880	1.10	0.33-3.60
No	84	84	23	85.2		0.91	0.28-3.00
Hours/week playing padel							
1-3	38	38	17	63.0	0.002*	0.11	0.02-0.53
3.5-5*	39	39	2	7.4		8.27	1.88-40.36
>5	23	23	8	29.6		2.12	0.62-7.20
Specific padel shoes							
Yes	84	84	20	74.1	0.250	1.84	0.67-5.06
No	16	16	7	25.9		0.54	0.19-1.50
Position in field							
Right	40	40	8	29.6	0.507	0.75	0.25-2.22
Left	30	30	8	29.6		1.33	0.44-3.96
Indifferent	30	30	11	40.7		1.83	0.65-5.11
Racket shape							
Diamond	25	25	4	14.8	0.026*	0.91	0.23-3.56
Teardrop	34	34	17	63.0		0.29	0.10-0.82
Round*	41	41	6	22.2		3.42	1.21-9.63
Racket material							
Carbon fiber	68	68	18	66.7	0.727	2.27	0.49-10.39
Fiberglass	5	5	3	11.1		0.44	0.09-2.02
Graphite	4	4	1	3.7		1.06	0.11-10.07
I do not know*	23	23	5	18.5		1.21	0.40-3.65
Racket weight							
330-355 g	22	22	5	18.5	0.045*	0.79	0.25-2.54
356-375 g*	61	61	11	40.7		1.26	0.39-4.04
376-390 g	13	13	6	22.2		0.39	0.12-1.24
>390 g	1	1	0	0.0		1.31	0.00-na
I do not know*	3	3	5	18.5		0.10	0.00-na

Each % has been calculated considering the appropriate subpopulation described in Table I (na: not applicable).

*Significant P<0.05.

and non-injured respondents is reported in Table III. No significant differences were found for gender, age, and handedness concerning the intrinsic factors (P>0.05). No significant differences were found for residence, training

experience, physical training other than padel, specific padel shoes, position in the field, and racket material concerning the extrinsic factors (P>0.05). However, spending between 3.5 to 5 hours per week playing padel, using a

participants playing between 3.5 and 5 hours per week and racket characteristics such as the shape (round racket) and weight (either not knowing or a racket weighting between 356 and 375g) were identified to increase the risk of injury. Our results are partially in line with the investigation of Munoz *et al.*⁵ who identified not only racket characteristics and weekly volume, but also gender as risk factors. In particular Munoz *et al.*⁵ reports that a racket with a weight greater than 350g increases the risk of injury. While no differences were reported among racket shape. Conversely, concerning weekly volume the authors reported an increased risk for those playing more than 6 hours/week. It is interesting to note that Munoz *et al.*⁵ identified that playing other sports or practicing physical training neither increased nor reduced the risk of injury. In practical terms playing between 3.5 and 5 h weekly corresponds to two to three matches per week which may be considered as a regular practice but not at as much as professional players. Unfortunately, the only study analyzing professional players¹³ does not report a mean weekly time spent playing padel. Muñoz *et al.*⁵ identified that greatest time spent playing padel, greater the occurrence of injuries. In our sample, the odds of occurring an injury were much higher in the 3.5-5-hour group compared to the above 5-hour group. However, it does not appear that those playing more than 5 hours weekly had a higher frequency of participating in specific training regimes compared to those spending less time playing padel. Another study that has evaluated the risk factors in padel is that by Priego Quesada *et al.*⁶ In this investigation, authors did not find increased injury neither for intrinsic factors nor for racket characteristics or playing volume. However, it has been observed that players who wore specific padel shoes were more prone to get injured. Considering the findings of the latter article,⁶ we included a specific question for shoes use within our questionnaire. However, we did not find a significant difference among respondents between injured and non-injured padel players according to the shoes worn. However, despite not being significant, the odds of getting injured were higher in those who declared to use specific shoes. The only investigation that has identified intrinsic risk factors is that by Castillo-Lozano *et al.*¹² who identified age, BMI, and players laterality as potential risk factors. Greater age, BMI, and being right laterality were deemed to increase the risk of injury. In our sample none of these factors were detected as factors to increase the risk of injury. However, it should be considered that in the study by Castillo-Lozano *et al.*¹² were recruited only senior (55-67 years) and junior players (14-20 years), while

our study included players from 18 years of age, with the majority of these being between 36 and 55 years, age range not examined by Castillo-Lozano *et al.*¹² As for tennis risk factors, playing volume, racket characteristics, biomechanics,²⁴ as well as characteristics of surface court²⁵ seem to influence injury occurrence. Padel is generally played on synthetic surfaces,²⁶ therefore this intrinsic factor cannot lead to variability in the incidence of injuries, as instead observed in tennis depending on the surface of the court. However, similar to tennis, it appears that racket characteristics and playing volume are factors to consider. Concerning biomechanical variables, since a very limited number of studies are available for padel, although plausible, it is premature to deduce that these can influence injury occurrence. As a matter of fact, literature concerning risk factors in padel is very limited and heterogeneous. Moreover, further studies from different geographical areas are needed to confirm padel risk factors.

Limitations of the study

Limitations of this study are that all data was collected through a customized self-administered questionnaire, therefore these may occur in self-reporting bias. Further limitation is that our questionnaire, as those present in previous similar investigations, is neither standardized nor validated. A strength of this study is that the administered questionnaire was created according to the recommendations for epidemiological studies in tennis¹⁴ which is a first attempt to uniform to international guidelines. The most common sites of injury were the lower leg/Achilles tendon and the elbow. The most common types of injuries were tendinopathies and contusions. As far as risk factors are concerned, the equipment used, and the time dedicated to the sport determine an increase in the probability of an injury occurring. Preventive exercises and training programs should be carried out by players, coaches and instructors in order to reduce the number of injuries. Further, the knowledge regarding extrinsic risk factors can contribute promoting the use of more appropriate equipment.

Conclusions

Our study detected that in a sample of 127 Italian recreational padel players, 100 occurred an injury during the last year which caused absence from padel from 8 to 28 days. The most common injury locations were the lower leg/Achilles tendon and the elbow. The most common injury typologies were tendinopathies and contusions. Concerning the risk factors, the amount of time playing padel

