International Journal of Wrestling Science

ISSN: 2161-5667 (Print) 2161-3524 (Online) Journal homepage: http://www.tandfonline.com/loi/uijw20

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To cite this article: Samuel David Grácio Pedro & Paulo Martins (2017) Engagement and Injuries in Wrestling Athletes, International Journal of Wrestling Science, 7:1-2, 1-8, DOI: 10.1080/21615667.2017.1330906

To link to this article: https://doi.org/10.1080/21615667.2017.1330906

Published online: 13 Mar 2018.

INTERNATIONAL JOURNAL OF WRESTLING SCIENCE, 7: 1–8, 2017

ISSN: 2161-5667 print / 2161-3524 online
DOI: https://doi.org/10.1080/21615667.2017.1330906

Engagement and Injuries in Wrestling Athletes

Samuel David Grácio Pedro[1] and Paulo Martins[2]

ABSTRACT. The study of psychological factors and their relationship with injuries in wrestlers is new field of research. Specifically, this study focuses on athletes' engagement and its association with injuries. We characterize other factors like training loads, total number of injuries, topography, and other symptoms. Thirty-five wrestlers from different ages and competitive levels respond to Athletes Engagement Questionnaire and demographic inquiry. Results indicate no association between wrestlers' overall engagement and total number of injuries. However, total number of injuries is associated with symptoms resulting from injury states, such as physical, behavioral, and psychological. We also give some guidelines regarding prevention and promotion of healthier wrestling experiences.

Keywords: engagement, sports injuries, Olympic wrestling

INTRODUCTION

Olympic Wrestling rules have changed in the last few years in order to enhance competition, dynamism, intensity, and spectacularity of the sport to fans. Such changes resulted in new adaptations for wrestlers and training processes. Still, it is important to understand if these changes consider wrestlers well-being and health by protecting and preventing injury-occurrence risks. A wrestling match is won by pinning the opponent's shoulders blades on the mat for at least 1 second. Also, the sport has two styles: Greco-Roman (where actions below the waist are not allowed and only men can participate) and freestyle (where men and women can participate and athletes may use arms and legs to obtain the pin) (Martins & Rosado, 2006).

As a combat and contact sport, all body parts are involved in the various moments of attack and defense, increasing the risk of injuries. At the 2008 Beijing Olympic Games, wrestling registered 32 injuries among 343 athletes in 406 matches with an incidence rate of 9.3 injuries per 100 athletes and 7.9 injuries per 100 matches (Akbarnejad & Sayyah, 2012). At the Rio Olympic Games, out of 352 wrestlers, 22 injuries occurred during 410 matches, corresponding to an incidence rate of 6.2 injuries per 100 wrestlers (7.1% male; 4.4% female) and 5.4 % per 100 matches. Related to the styles, the injury occurrence was 22.7% in female wrestling, 36.4% in freestyle, and 40.9% in Greco-Roman (Shadgan, Molnar, Sikmic, & Chahi, 2017). The same authors mention that injury rates have been decreasing in Olympic wrestling (Beijing 2008 [9.3%], London 2012 [12%], and Rio 2016 [6.2%]).

Despite decreasing injury rates, it is still essential to analyze how training processes, coaches, and athletes' characteristics may help in preventing and promoting a more secure and healthy sports practice. Injury occurrence is random and uncontrollable, and there is no doubt about its impact on athletes' health, performance, and sports experience.

Evidence-based research reveals that modern sports promotes a culture of competition and winning at all cost; in Olympic wrestling, this tendency indicates that athletes see themselves obligated to compete even when injured, underwriting a culture that promotes pain normalization (Hoppis, 2012). The same author notes that wrestlers report that they are required to compete by coaches, teammates, and managers even when injured, specifically 44.6% from coaches and 55.9% from physical trainers. These findings imply that wrestlers' career quality, health, and positive experiences are at risk since such behaviors and beliefs increase the risk of creating a cycle of re-incidence due to a deficient recovery process (Hoppis, 2012; Nor, 2001).

[1]*Universidade Lusofona de Humanidades e Tecnologias, Lisboa, Portugal*
[2]*Universidade de Lisboa Faculdade de Motricidade Humana, Sport and Health, Cruz Quebrada, Portugal*
Correspondence should be addressed to Samuel David Grácio Pedro, Universidade Lusofona de Humanidades e Tecnologias, Rua Antero de Quental nº18, Lisboa, 1749-024 Portugal. E-mail: samuelgraciopedro@gmail.com

Allied to occurrence and (re)incidence of injuries, research informs us about the association of psychological factors, such as athletes' volition, anxiety, fear, confidence, and engagement, and their interaction and important role in recovery and capability to return to competition (Akbarnejad & Sayyah, 2012; Nor, 2001; Wiese & Weiss, 1987).

Brynhildsen, Ekstrand, Jeppsson, and Tropp (1990) from Cohen, Abdalla, Ejnisman, and Amaro (1997) propose a modified version for injury classification in wrestling, dividing them into concussions, fractures, luxations, sprains, muscular injuries, and tendinitis and fittingly into topography by body segments (lower limbs [tight, knee, leg, ankle, and foot], upper limbs [shoulder, arm, elbow, forearm, wrist, and hand], and torso).

Injury states are stressful situations able to negatively impact athletes' psychological states; however, some psychological factors seem to protect and promote positive interactions with injury states. For instance, athletes' engagement is the main reason to participate and continue in sports, where higher levels result in greater quantities of pleasure and excitement during sports participation. Such a factor is also associated with higher levels of participation, while reduced levels seem to increase drop-out potential (Castillo, Balaguer, & Duda, 2000; Castillo, Tomás et al., 2010; Gill, Gross, & Huddleston, 1983).

In the sports context, engagement is a continually and relatively stable sports experience with positive effects on cognition about the overall sports experience (Londsdale, Hodge, & Jackson, 2007; Lonsdale, Hodge, & Raedeke, 2007). Skinner and Pitzer (2012) suggest that engagement is a malleable state, open to context interaction, modeled by task and interpersonal characteristics, occurring in cycles, being also a positive and persistent cognitive–affective experience.

Athletes' engagement has four dimensions: confidence (the belief in one's own competence in achieving high levels of performance and achieving defined goals); dedication (the desire to invest effort and time in meaningful goals for the individual); enthusiasm (feelings of excitement and high levels of pleasure and satisfaction); and vigor (which is the physical and psychological feeling of vivacity) (Lonsdale, Hodge, & Jackson, 2007; Lonsdale, Hodge, & Raedeke, 2007). Besides, engagement manifests in emotional, cognitive, and psychological characteristics, and some research suggests that engagement promotes better sport and academic performance; nevertheless, this is a recent field of study in sports and educational research (Londsdale, Hodge, & Jackson, 2007; Lonsdale, Hodge, & Raedeke, 2007; Skinner & Pitzer, 2012).

Another important feature is the relationship among motivation and engagement, and its effects on intentional behaviors, where motivation is related to energy sources, direction, and duration towards an action, and engagement is the visual manifestation of motivation representing those energies' direction and duration. This statement is supported where constructs, like effort, volition, vigor, intensity, vitality, and enthusiasm, are indicators of energy; interest, focus, and concentration are indicators of direction; absorption, determination, and persistence are signs of duration (Mageu & Vallerand, 2003; Skinner & Pitzer, 2012).

Some studies also indicate that stressful periods and events have a negative impact on athletes' motivation and engagement. When athletes are not capable of cooperation with context, factors like less autodetermined behaviors, confused cognitions, and negative emotions may manifest due to behavioral, physical, and psychological symptoms or signs impacting sports performance, participation, and injury-recovery processes (American College of Sports Medicine, 2006).

In conclusion, in sports, some psychological profiles and personal characteristics are efficient in promoting sports performance and positive experiences. In wrestling, these profiles are linked to higher levels of confidence, emotional and cognitive control, focus and visualization strategies, and abilities to cope with stress (Berengüí, López, Garcés de los Fayos, & Almarcha, 2011). Since injury states may impact engagement levels, and this is an important factor for positive experiences and performances, studying the impact of injuries on wrestlers' engagement levels is important, because wrestling is a high-risk sport for injuries (Barroso et al., 2011; Deci, 1992; Pappas, 2007; Podlog & Eklund, 2005).

METHOD

Participants

The following study was conducted in a Portuguese Olympic wrestling competition. A total of 35 athletes (26 Men; 9 Women) of ages between 13 and 40 years old (M = 20.45; SD = 6.67) from different age brackets (cadets [n = 14], juniors [n = 9], and seniors [n = 12]) participated in this study. Twenty-five of them competed at the national level, while 10 competed at the elite level. Concerning practice experience, the minimum was 1 year and the maximum was 20 years (M = 7.6 years; SD = 5.8), and the frequency of sessions per week was set at a minimum of two sessions and a maximum of 12 sessions per week (M = 3.9; SD = 1.9).

Instruments

Demographic Questionnaire

Information was collected regarding the following variables: gender, age, year of school, age group, wrestling style, time in the sport, weekly training sessions, total number of injuries, topography and the diagnosis of injuries that occurred during the practice of wrestling (we only considered an injury as those that obligated the athlete to interrupt their sports practice), type of treatment, and time of recovery to return to practices. Also, we gathered information

about the injury origin, such as during stress periods, weight loss, competition or practice, and what technique or movement was being executed at the time of the injury.

Athletes Engagement Questionnaire

The Athletes Engagement Questionnaire has been validated to the Portuguese context by Martins, Rosado, Ferreira, and Biscaia (2014) and was adapted from Lonsdale, Hodge, and Jackson (2007). The Athletes Engagement Questionnaire has four first-order factors: confidence, dedication, enthusiasm, and vigor. The internal consistency values (Cronbach's Alpha) of the sample in our study vary between .54 and .89 (confidence: $\alpha = .89$; dedication: $\alpha = .85$, enthusiasm: $\alpha = .70$; and vigor: $\alpha = .54$). The questionnaire comprises 16 items, and each participant was required to answer using a 5-point Likert scale, where 1 corresponds to "Almost never" and 5 corresponds to "Almost Always."

Procedures

The coaches were contacted in order to get their consent and to invite and prepare their athletes for participation in the study. With the help of coaches, we again explained to the athletes the importance of their participation. Next, athletes were informed about the aims of the study, confidentiality, and the anonymity of their answers, and they gave their agreement by signing an informed-consent form. After this, the questionnaires were distributed to the athletes and completion of the questionnaires took approximately 20 minutes. We collected 50 questionnaires, and, after data screening, 35 were deemed sufficient for further analysis.

Data Analysis

Data were analyzed using the Statistical Package for Social Sciences v. 20 (SPSS, IBM Corp., Armonk, NY, USA) and descriptive and inferential statistics were used both to characterize and examine the correlations between the variables. Subsequently, demographic data were described by calculating the mean and standard deviation. The correlations between variables were measured using the Spearman correlation coefficient. Statistical significance between groups was assumed at $p < .05$.

RESULTS

A total of 77 injuries were reported by the 35 inquired wrestlers, and the details are presented in Tables 1 and 2. Nevertheless, only 39 of the injuries were in line with the definition of injury for this study: We only considered injury as those states that obligated athletes to interrupt their sports practice. Moreover, in Tables 3, 4, and 5, the results are displayed concerning the missing cases of 14 wrestlers.

TABLE 1 Percentage, Localization, and Topography of Injuries

Head	*Inferior Limbs*	*Superior Limbs*	*Torso*
0%	40%	44%	16%

TABLE 2 Frequencies of Injuries Diagnosis

Muscular Injuries	*Fracture*	*Sprain*	*Luxations*	*Tendinitis*	*Others*
30%	26%	19%	7%	7%	11%

The results revealed that most injuries occur at the age of 18 years old ($n = 8$) followed by the age of 16 years old ($n = 5$) and 17 years old ($n = 4$). Altogether ($n = 17$), they represent approximately 50% of the total injuries that occurred in the athletes of the study. When considering age bracket, results showed that seniors ($n = 12$) and cadets ($n = 14$) are the most scored cohorts, that is, injuries occur mainly during the senior (> 18) and cadet (14–17) years of the athletes' careers. The most common injuries in cadets are fractures (11.1%) and muscular injuries (11.1%); in juniors, fractures (7.4%), sprains (7.4%), and tendinitis (7.4%) are most common; in seniors, the most common injuries are muscular (14.8%). The results of the study also revealed that the most common type of treatment was physiotherapy ($n = 10$), followed by quiroteraphy ($n = 5$) and approved drugs ($n = 3$). When considering its origin, the results revealed that injuries occurred more in stressful periods (32,1%), compared with weight-loss periods (25.9%), with this tendency being more evident for seniors (42.9%) and cadets (44.4%). Most injuries happened during training sessions (17), while nine took place during competitions.

Regarding which technique or movement was more associated with injury occurrence, athletes reported "gut wrenches" and "middle" to "high" amplitude throws. A Mann-Whitney Test indicated that recovery time for injuries was greater in male wrestlers than for female wrestlers ($U = 24.5$, $p = .009$). Also, concerning the competitive level, tests indicated that dedication ($U = 59.0$ $p = .012$) and enthusiasm ($U = 72.0$, $p = .039$) were greater in international-level wrestlers than national-level ones. The last difference between groups was found with a Kruskal-Wallis test concerning age brackets, where cadets, $H(2) = 6.78$, $p = .34$, revealed greater psychological symptoms when injured than juniors and seniors.

Concerning association tests, the Spearman correlation are shown in Tables 6 with the following results. First, there is no association between engagement and its dimensions with the total number of injuries of wrestlers. However, the total number of injuries is positively associated to age, $r(35) = .517$, $p < .01$, and practice time, $r(35) = .401$, $p < .05$. Also, the total number of injuries is negatively associated—

TABLE 3 Cross-Table Between Topography and Diagnosis of Injuries (25 Valid Cases and 14 Missing Cases)

	Diagnosis						
Topography	*Fracture*	*Luxations*	*Sprain*	*Muscular Injuries*	*Tendinitis*	*Others*	*Total*
Superior Limbs	4	2	0	3	2	0	11
Torso	2	0	0	2	0	0	4
Inferior Limbs	1	0	4	2	0	3	10

TABLE 4 Cross-Table Between Topography and Segment Localization of Injuries (25 Valid Cases and 14 Missing Cases)

	Localization												
Topography	*Bicep*	*Arm*	*Ribs*	*Elbow*	*Hand*	*Knee*	*Lower Back*	*Shoulder*	*Foot*	*Torax*	*Leg*	*Wrist*	*Total*
Superiors Limbs	1	2	0	2	1	0	0	4	0	0	0	1	11
Torso	0	0	1	0	0	0	1	0	0	2	0	0	4
Inferiors Limbs	0	0	0	0	0	4	0	0	3	0	3	0	10

TABLE 5 Cross-Table Between Topography and Recovery Time of Injuries

	Recovery Time					
Topography	*< 1 Week*	*<2 Weeks*	*< 3 Weeks*	*< 4 Weeks*	*< 2 Months*	*Total*
Superior Limbs	2	1	1	2	5	11
Torso	0	3	0	0	1	4
Inferior Limbs	2	0	1	2	5	10

this is when one variable increases when the other decreases —with injury occurrence in stress periods, $r(35) = –.401$, $p < .05$), behavioral symptoms regarding injury states, $r(35) = –.377$, $p < .05$, and physical symptoms regarding injury states, $r(35) = –.485$, $p < .05$. Moreover, psychological symptoms regarding injury states are negatively associated with the number of training sessions, $r(35) = –.411$, $p < .05$, and positively associated with behavioral symptoms, $r(35) = .519$, $p < .01$. Furthermore, an occurrence of injuries in competition is associated with occurrence of injuries in stress periods, $r(35) = .401$, $p < .05$.

Finally, concerning wrestlers' engagement dimensions, confidence is positively associated with behavioral symptoms regarding injury states, $r(35) = .445$, $p < .05$, and negatively associated with injuries occurring in weight-loss periods, $r(35) = –.389$, $p < .05$. Also, vigor is negatively associated with physical symptoms regarding injured states in wrestlers, $r(35) = –.397$, $p < .05$, and overall engagement is negatively associated with physical symptoms regarding injured states in wrestlers, $r(35) = .519$, $p < .01$.

DISCUSSION

The Portuguese Olympic wrestling context research is very scarce; with this study, we explore topography and the diagnostics of wrestling-injury types and the relationship between those injuries and the wrestlers' engagement levels. For this article, an injury was a condition that limited function and obligated the athletes to search for help with health professionals or some condition that forces the abandonment of a match or training session, accordingly with the criteria of the National Athletic Injury Reporting System (NAIRS; McLennan & McLennan, 1990).

Regarding topography, superior limbs had the most injury reports (44%), followed by inferior limbs (40%) and torso (16%). The same type and direction of injuries were reported by Berengüí et al. (2011) in a sample of 19 Spanish wrestlers, where 50% of injuries were related to superior limbs, 26% to inferior limbs, 21.7% on the torso, and 2.17% in the head and neck. In addition, Barroso et al. (2011), in a sample of 95 Brazilian wrestlers, found that the most affected segments were the inferior limbs (61%), followed by superior limbs (29%) and torso (10%). Kordi, Zieaee, Rostami, and Wallace reported in 411 Tehran wrestlers that injuries were more present first in the superior limbs (80%), followed by inferior limbs (61%), torso (14%), and head and neck (9%). The results found in our study and the others mentioned are in line with Hewett, Pasque, Heyl, and Wroble (2005) in which they critically reviewed epidemiological wrestling injuries in American College Wrestlers and reported that neck and head injuries are commonly between

TABLE 6 Spearman Correlation Between All Variables

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*
1. Age	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2. Practice Time	.454**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3. Weekly Sessions	–.142	.198	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4. Total Number of Injuries	.517**	.401*	–.028	–	–	–	–	–	–	–	–	–	–	–	–	–	–
5. Stress Periods	–.430*	–.051	.105	–.401*	–	–	–	–	–	–	–	–	–	–	–	–	–
6. Weight-Loss Periods	–.393*	–.081	.429*	–.175	–.014	–	–	–	–	–	–	–	–	–	–	–	–
7. Injuries in Competition	–.304	–.135	–.032	–.305	.401*	–.060	–	–	–	–	–	–	–	–	–	–	–
8. Injuries in Practice	–.011	–.250	.221	–.090	–.287	.077	–.566**	–	–	–	–	–	–	–	–	–	–
9. Recovery Time	.200	.019	.056	.178	–.011	–.085	–.011	.000	–	–	–	–	–	–	–	–	–
10. Confidence	.042	–.120	–.246	.035	.139	–.389*	–.046	.054	.180	–	–	–	–	–	–	–	–
11. Dedication	–.106	.183	.176	–.014	.152	.028	–.068	.084	.184	.292	–	–	–	–	–	–	–
12. Vigor	.201	.119	.062	.167	.032	–.352	–.041	.027	.138	.299	.438**	–	–	–	–	–	–
13. Enthusiasm	.187	.337	.185	.183	.041	–.375	.059	–.165	.226	.268	.342*	.554**	–	–	–	–	–
14. Engagement	.026	.074	.039	.095	.141	–.354	–.030	.027	.284	.721**	.687**	.741**	.679**	–	–	–	–
15. Behavioral Symptoms	.093	–.239	–.262	–.377*	.212	–.111	.000	.037	.048	.445*	–.027	–.134	–.174	.098	–	–	–
16. Physical Symptoms	–.059	–.123	–.043	–.485**	.295	.318	.085	–.079	–.332	–.230	–.341	–.397*	–.313	–.449*	.324	–	–
17. Psychological Symptoms	.115	.131	–.411*	–.267	–.025	–.101	.073	.026	.065	.258	.008	.129	.029	.191	.519**	.154	–

*p = .05. **p = .01.

0.8% to 14.9%, followed by superior limbs between 9.3% to 42%, torso and spine between 1.2% to 18.6%, and finally inferior limbs 7.6% to 18.7%.

Related to the injury diagnosis, the most recurrent in our study were muscular injuries (30%), fractures (26%), sprains (19%), others (11%), and luxation and tendinitis both were 7%. In the study of Barroso et al. (2011), the most significant diagnoses were sprains (34.5%), muscular injuries (30.4%), tendinitis (14.5%), luxations (10.3%), fractures (6.2%), and finally concussions (4.1%). Kordi, Zieaee, Rostami, and Wallace (2012) had the following results: sprains (31%), fractures (17%), strains (14%), luxations (11%), bruises (4%), and others (23%). The results of our study regarding the diagnostics of injuries are also in line with the findings of Hewett, Pasque, Heyl, and Wroble (2005).

With these data, we may assume that there is no substantial difference between the studies regarding topography and diagnostics of injuries in wrestling; nevertheless, we may assume that each country has its own wrestling culture. For instance, in Portugal, the main style is Greco-Roman, while in Brazil freestyle is gaining more interest with wrestlers, Spain has both styles very solid in their culture, and the same is true in some of the world's wrestling powers, such as Russia, Iran, Turkey, and the United States. By this, we mean it is expected that, regarding their cultural heritage, national competitive level, and level of wrestling community development, each country embodies different topographies and diagnostics of injuries.

Secondly, this article aimed to understand the relationship between sports injuries and wrestlers' engagement levels; this is important since psychological factors, such as motivation, engagement, stress, resilience, and others play a significant role when interacting with states of injuries, both in prevention and in rehabilitation (Deci, 1992; Nor, 2001).

So, with the results of this study, we found that, with this sample, there was not an association between the total number of injuries of wrestlers and their engagement levels, nor with dimensions of confidence, dedication, enthusiasm, and vigor, contrary to the hypothesis formulated. The results of Podlog and Eklund (2005) indicated that injury occurrence in the workplace is positively associated with less engagement by workers. Such a difference may come from the specificity of the context of action, since sport, and, specifically, wrestling, has a growing subculture of competing and training even when injured, mostly prompted by coaches and physicians. Also, it may suggest that wrestlers or sportsmen may have a significant relationship with the sport that does not allow, by some unknown psychosocial mechanism, wrestlers to develop negative affections with the sport even when injured, but still more research is needed.

Nevertheless, injury rates increase with time practicing the sport and age. It also appears that, when wrestlers get used to being injured, they tend to value less the stressful periods or events of their training and competition season, showing that wrestlers, as they progress in sports practice and their sports career, are more eager to manage and deal with stress periods. Similarly, they tend to show less physical symptoms related to being injured, like feeling ill, clammy hands, profuse sweating, headaches, increased muscle tension, and altered appetite.

Furthermore, wrestlers' injuries are also associated with competition stress, meaning that it is important for coaches, physicians, and athletes to understand that competition is a place where the most variables are out of control, contrary to practice. So, athletes and coaches need to develop some tools and strategies in order to prevent injury occurrence. Such tools may be appropriate supervision, warm-up, controlled risk maneuvers, controlled infractions, concern about athletes' experiences and physical fitness, and mental and physical states, or even stopping the competition if the wrestler is already injured.

Despite this, we have not found any relationship between injuries and engagement in this study, but we discovered that there is a positive association between confidence levels and behavioral symptoms when injured. This may mean that wrestlers' beliefs regarding one's own competence in achieving high levels of performance and defined goals are associated with behaviors like trouble sleeping, lack of focus, performing better in training than in competition, loss of appetite, or increased substance abuse. These results might come from the competition mindsets of wrestlers and previous moments related to competition or moments of evaluation, like weight loss, competition, or training while injured; nonetheless, more research is needed.

Another result of this study is linked to confidence levels and their negative correlation with injuries occurring in weight-loss periods, which might be related to deprivations that wrestlers encounter during weight-loss periods and their effects on psychological mind states and the athletes' abilities to learn during their career how to manage athletic issues.

Likewise, vigor seems to be negatively associated with physical symptoms regarding injured states; this may mean that feelings of physical and psychological vivacity are affected by physical symptoms when injured, such as feeling ill, clammy hands, profuse sweating, headaches, increased muscle tension, and altered appetite.

Finally, this study reveals that overall engagement is negatively associated with physical symptoms while injured. This is when wrestlers are more positive about their cognitions regarding their overall sports experience and they tend to show less physical symptoms while injured.

This is the first study that analyzes the relationship between injuries and athletes' engagement. More specifically, this is also the first study that analyzes topographically and diagnoses types of injuries in Portuguese wrestlers. So,

this is a study that contributes to deepening the related knowledge about combat-sports-injury diagnosis and topography, specifically to the Portuguese context.

Our results differ from other studies, enlightening that each injury is unique and depends on several dynamics found both in combat and training settings, which does not allow one to characterize concisely injury types in wrestling. Nevertheless, it is well established that wrestling is a high-risk sport for injuries since all body segments have registered injury in some study or another.

Notwithstanding, the main hypothesis rejection, that engagement levels and its dimensions were expected to be associated with the total number of injuries in wrestlers, and this study contributed to another kind of results.

We did not find any direct association between engagement and injuries: However, injury states are more than physical states; they are also behavioral and psychological. This article reveals that, instead of a direct association between injuries and engagement, athletes' engagement is affected by injuries regarding their physical, behavioral, and psychological symptoms or signs. Specifically, athletes' engagement dimensions like vigor and confidence are related to physical and behavioral symptoms in a nonreciprocal manner. This may mean that, during their career and along with injury occurrences, wrestlers are able to maintain positive psychological states, allowing them to learn how to cope and manage stress events and periods due to injury states.

In conclusion, this study contributes to the characterization of wrestling injuries regarding topography and diagnostics and it also enlightens that injury states are in fact associated with psychological factors. However, this is not a direct association since the impacts of an injury can be manifested by behavioral, psychological, and physical symptoms. Also, these results may help one understand why engagement may be a visual manifest of motivated and intentional actions; however, more research is needed.

Despite these findings, this study has some limitations like the cross-sectional character and reduced sample, which do not allow us to generalize the results to other sports or countries. Nevertheless, this article characterizes, in general, the Portuguese wrestlers' population regarding injuries topography, diagnostics, and their association with engagement and other injury symptoms. Future studies should account for other variables or apply the study while athletes are injured and during their recovery process.

Practical Implications

These study results allow the understanding that each injury is unique and dependent upon variables related both to athletes' physical and behavioral aspects and to psychological ones. Also, it may help athletes, coaches, and physicians expand the tools and strategies used to prevent injury states and may allow professionals to understand other factors beyond physical ones in promoting positive recovery processes in wrestlers. In order to best protect their athletes, coaches must maintain a quality relationship that takes into account the athletes physical, behavioral, and psychological functioning. Our results indicate that coaches, and other support personnel, can develop strategies for both the prevention of injuries, as well as for the period following an injury, that supports the athlete's psychological functioning by mitigating the negative psychological effects associated with returning to training and competition.

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