

The Effect of Psychological Response on Recovery of Sport Injury

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The aim of this study was to analyze how psychological responses influence the physical and sporting recovery of an injured person. The sample comprised 20 amateur football players aged between 18 and 35, with moderately serious or serious injuries. The psychological variables evaluated were mood states, subjective estimation of the injury and adherence, and the psychological response was assessed continuously, from the beginning of the treatment until its completion. The results indicate that as the subjects recovered from their injuries, they gradually adopted the ICEBERG profile, which is characteristic of good performance. Subjective estimation of the injury was inversely related to the time required for physical and sporting recovery (Physical R: Sig: = 0.60, $p < 0.05$; Sporting R: Sig: = 0.61, $p < 0.05$). Similarly statistically significant relationships were found between mood state and physical recovery (Sig: = 0.60, $p < 0.05$) and adherence to the rehabilitation program and sporting recovery (Sig: = -0.66, $p < 0.001$). The results of this research project suggest that the psychological response of sportsmen

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regarding coping with their injury is, in statistical terms, significantly related to the achievement of an optimum recovery.

Keywords sport injury, rehabilitation period, mood state, subjective estimation, and adherence

Introduction

The risk of injury and its subsequent consequences are an integral part of all types of sporting activity, at both a recreational and competitive level. Additionally, if we take into account the considerable increase in the sporting population over recent years, we see that this risk has become a large social problem (Kraus and Conroy 1984; Uitenbroek 1996; Yaffe 1983).

Frequently, the immediate consequence of a sporting injury is a period of inactivity, which gives rise to numerous adverse situations for both the sportsman or -woman him- or herself and his or her environment. (Buceta, Bueno, Ramírez, et al. 2000). This turns the occurrence of a sporting injury into a potentially stressful situation for a number of different reasons (Bueno, Buceta, Gallego, et al. 1999; Danish 1986), including pain in the injured area and general uncomfotableness; the triggering of adverse emotional reactions (anger, irritability, depression, etc.); the occasional necessity for hospitalization and surgical intervention; the perception of a lack of control over the situation; and finally, on occasions, chronic deterioration or permanent disability (Hardy and Crace 1990; Silva and Hardy 1991). Therefore, the ability to remain relatively injury-free and to recover rapidly when injured is important to any athlete's longevity and success (Buceta 1996; Heil 1993).

In a review of different studies focusing on recovery, Brewer (1994) lists and highlights the importance acquired by the personal and situational variables that accompany the injury in relation to the presence, duration, and intensity of the injured person's response to stress. Regarding the situational variables, Brewer suggests a higher rate of stress in the presence of variables such as more serious injuries, considerable interruption of daily activities, and the presence of other stressful events. Similarly, he relates a lower level of stress with variables such as a good prognosis of the injury, progress made in the recovery process, social support, and a lower level of sporting performance in the period immediately prior to the injury. According to Brewer (1994), among the personal variables that may exacerbate or reduce the stressful nature of the situational variables, the most relevant are successful recovery from previous injuries, the degree of personal commitment to the sport, age, and way of thinking.

These considerations also are taken into account in the model proposed by Wiese-Bjornstal, Smith, Shaffer, et al. (1998), who suggest that preinjury personal and situational factors (Andersen and Williams 1988) and postinjury

consequences (Wiese-Bjornstal, Smith, and LaMott 1995) influence an individual's psychological response. An individual's psychological response can and does change dynamically over time, and recovery is the outcome of the process. The authors suggest that once a sporting injury occurs, its psychological consequences encompass cognitive, emotional, and behavioral responses. Assuming this to be true, the general objective of our study is to analyze the psychological response of injured athletes during their recovery period.

In relation to emotional response, there seems to be a unanimous agreement between researchers, who all coincide in affirming that sportsmen and -women suffer from adverse emotional states as a consequence of the stress generated by injury, both immediately after its occurrence (Chang and Grossman 1988; Pearson and Jones 1992; Ramírez, Alzate, and Lázaro 2002; Weiss and Troxell 1986) and during the recovery period. In the latter case, certain discrepancies have been noted between the results obtained by different authors. On the one hand, some authors maintain that changes in the injured person's mood state are intrinsically linked to his or her perception of recovery (McDonald and Hardy 1990; Smith, Scott, O'Fallon, et al. 1990). Other authors (Le Mott 1994; Morrey 1997) argue that the emotional changes follow a U-type evolution, with the injured person suffering from a negative mood state immediately after the injury, a slightly more positive outlook during the second and third periods, and then a more negative attitude once again during the final recovery period. Studies analyzing the emotional response frequently have used the POMS questionnaire (McNair, Lorr, and Droppleman 1971). One of the most interesting contributions made using this instrument are the studies carried out by Morgan (1980), in which the author describes the ICEBERG profile. This profile outlines a series of sporting data that are characteristic of good performance, with tension, depression, anger, fatigue, and confusion being located beneath the 50th percentile, and vigor being above this figure. Despite a lack of agreement between the results obtained, it seems logical to assume that as athletes recover from their injuries and acquire a level of performance similar to that achieved before their occurrence, their mood state profile should gradually grow to resemble the ICEBERG profile proposed by Morgan, as a predictor of good sporting performance. In light of this, the second objective of this study is to assess how the different mood state factors fluctuate from the beginning to the end of the recovery period.

However, the impact of the injury does not affect only the emotional response of athletes. The results obtained in some studies suggest that the cognitive response also is affected. Brewer (1993), for example, used a physical self-worth subscale with injured athletes at a sport medicine clinic and found that it predicted postinjury depression; and Leddy, Lambert, and Ogles (1994) found significant pre- and postinjury differences in global self-esteem. Similarly, other studies (Chang and Grossman 1988; McGowan, Pierce, Williams, et al. 1994) found significant differences in this variable between injured and

noninjured athletes. Among the cognitive appraisals that have been studied within the context of sporting injuries, perceptions about recovery are one of the best documented. There are, however, others—such as the athlete's perception of the extent of the injury, seriousness, interference with short- and long-term sporting expectations, and fear of relapse upon competing once again—that can also influence the length of the recovery period and that have received significantly less attention from researchers. In this area, special mention should be made of the studies carried out by Crossman and Jamieson (1985) and Crossman, Jamieson, and Hume (1990). These authors analyzed the differences in injured people's perception of the seriousness of their injury and its effect on their recovery. According to the results obtained, overestimation of the injury is significantly linked to greater pain and a more serious prognosis, in addition to a number of underlying psychological characteristics, such as greater anxiety, apathy, and so on. Regarding this last group of variables, this study focuses on analyzing whether the subjective estimation of the injury changes in accordance with the different rehabilitation periods, and what influence this has on recovery.

However, if there is one important variable upon which optimum recovery depends, this is the level of adherence to the rehabilitation program. An exhaustive review by Brewer (1998) shows the relationship found between this variable and a series of personal and situational factors—such as internal motivation, pain tolerance, and anxiety (personal factors)—and social support and the quality of the rehabilitation program (situational factors). The results indicate that the level of adherence is positively related to social support, internal motivation, and pain tolerance (Duda, Alison, and Tappe 1989; Fisher, Domm, and Wuest 1988, Weiss and Troxell 1986), while alterations in the mood state, concern over sporting expectations, and anxiety all show a negative relationship with the variable in question (Daly, Brewer, Wan Raalte, et al. 1995; Eichenhofer et al. 1986; Fisher et al. 1988).

Furthermore, as Shelbourne and Foulk (1995) indicate, it should be taken into consideration that some athletes tend to be impatient regarding recovery, and as such, on many occasions do not comply with medical protocols in a disciplined manner. Therefore, regarding the behavioral response, the aim of this study is to analyze athletes' adherence to their rehabilitation program during the recovery period.

Finally, from our point of view, if psychological response does play a key role in recovery from injury, despite not having been the focus of many studies, this is mainly due to its potential effect on the time required for recovery. When we speak of recovery from injury, we refer to both physical and sporting recovery. The few studies that have analyzed recovery from injury have concentrated solely on the moment at which the athlete resumes his or her sporting activity. However, it is evident that if the psychological response of the injured person is important during the recovery process, it is also important

during the attempt to regain the level of performance obtained prior to the injury (a process we have termed *sporting recovery*), which, in short, is the ultimate indicator of optimum recovery. Therefore, it may be supposed that, in addition to influencing physical recovery from the injury, the psychological response also affects the time required for sporting recovery, and that injured people who recover more quickly in both senses are those demonstrating a better mood state, greater adherence, and a less serious subjective estimation of their injury.

Method

Sample Group

The sample group comprised 20 injured athletes who were treated and diagnosed at the Sporting Medicine Unit of the Clínica del Pilar (San Sebastián, Spain). All were senior-category amateur soccer players, aged between 18 and 35, participating in a regional competition during the season in which the data collection process took place. As to the type of injury, the selection criteria were as follows: Injuries had to be recent (occurring no more than 1 day prior to the first visit), new (i.e., not relapses or previous injuries from which the athlete had not recovered properly), and medically diagnosed as moderately serious or serious. In other words, injuries with an estimated recovery period of over 15 days of treatment.

Variables and Instruments

The study focused on effects on recovery of three psychological variables: subjective estimation about the injury, mood state, and adherence to the rehabilitation program. In order to assess the injured person's mood state, the Spanish version of the abbreviated 58-item POMS scale was used. This scale was translated into Spanish by Pérez and Cortes and is based on the *Profile of Mood States* (McNair, Lorr, and Droppleman 1971). The POMS includes scales for tension (T), depression (D), anger (A), vigor (V), fatigue (F), and confusion (C) and asks the individual, "How have you been feeling at this moment?" This questionnaire measures total mood disturbances ($TMD = 100 + T + D + A + F + C - V$) and provides individual subscale scores.

The second of the variables studied (adherence) is defined as the injured person's level of compliance with the medically prescribed rehabilitation plans. To assess this variable, the authors used a personalized record sheet, designed specifically in each case in accordance with the rehabilitation plans recommended by the attending doctor. The injured athletes completed this sheet on a weekly basis, and the scores obtained in the different categories were used to determine their weekly adherence mean. To calculate each person's total adherence level throughout the entire recovery period, the mean score was

calculated on the basis of the partial mean scores corresponding to each of the different assessment phases.

Finally, in order to assess the subjective estimation of the injury, a specific questionnaire—the subjective injury estimation questionnaire (SISQ)—was designed. The questionnaire comprised four items, assessed by means of a Likert-type scale, with scores oscillating between 0 and 4. Two different types of measurements were used when working with this instrument; on the one hand, the global score (G.S.) of the subjective injury estimation; and, on the other, the score obtained in each of the different items assessed: seriousness of the injury (S.I.), interference with short- and long-term expectations (I.S.T.E./I.L.T.E.), and fear of future relapse (F.F.R.). The criteria variables defined in this study were physical recovery (P.REC.) from the injury and sporting recovery (S.REC.). The first of these refers to the period between the date of the injury itself and the date on which the athlete was declared medically fit. The second variable refers to the period between the date on which the athlete was declared medically fit and the moment at which he achieved a performance level on a par with that obtained in similar competitive situations before the occurrence of the injury. The term *similar competitive situation* is stressed because sometimes, following recovery, athletes attain a good level of performance during training sessions, but not during competitive situations, where the risk of relapse or further injury is more acute.

Procedure

During their first visit to the clinic following the injury, the athletes were invited to participate voluntarily in this research project. All those who agreed were asked to complete the POMS and SISQ questionnaires. During this visit the attending doctor estimated the optimum recovery period for each injured person. This information was used as a means of assessing the seriousness of the injury and as a criterion for including the person in the study. Subsequent psychological assessments were arranged to coincide with the check-up dates agreed upon by the doctor with each individual patient. In this way, every time the athletes came to the clinic for a medical check-up, they would complete the aforementioned questionnaires. This continued until the injured person was declared medically fit.

As of the first visit, the injured person's level of adherence to the rehabilitation program also was assessed, as defined in the corresponding section of this article. Of all the data collected, only those that coincided with the following moments were selected for analysis: initial, intermediate, and final assessment. The initial assessment was carried out when the injured person visited the clinic for the first time; the intermediate assessment was carried out in accordance with the length of the recovery period; and the final assessment was carried out on the date the injured person was declared medically fit.

Data Analysis

The results are presented in three different sections. The first focuses on the *psychological response of the injured person during the recovery period*. Friedman's test was used for analyzing the emotional and cognitive response, and behavioral response was assessed using the Willcoxon test. In the second section, the *relationship between psychological response and recovery* was examined using Pearson's correlation coefficient. Finally, the *differences between psychological responses to injury in accordance with physical and sporting recovery* were analyzed using U Mant Watney's test, with physical and (previously dichotomized) sporting recovery being taken as factors.

Results

Psychological Response of Sportsmen During the Recovery Period

Emotional Response

Table 1 shows the POMS scores recorded at each specified assessment. Significant main effects were found for D, A, V, and TMD. It was observed that the negative dimensions, D ($p < 0.05$) and A ($p < 0.05$), decreased during the recovery period. It is also interesting to note the behavior of the V factor, whose evolution throughout this period is U-shaped, decreasing during the initial period and then increasing once again around the date on which the athlete was declared medically fit ($p < 0.05$). However, if the behavior of the mood state is analyzed in global terms (TMD), it is apparent that it becomes more positive as the recovery process progresses ($p < 0.01$).

Graphically, the data indicate that as they recovered from their injury, the injured athletes gradually adopted the ICEBERG profile, which is characteristic of good performance (see Figure 1).

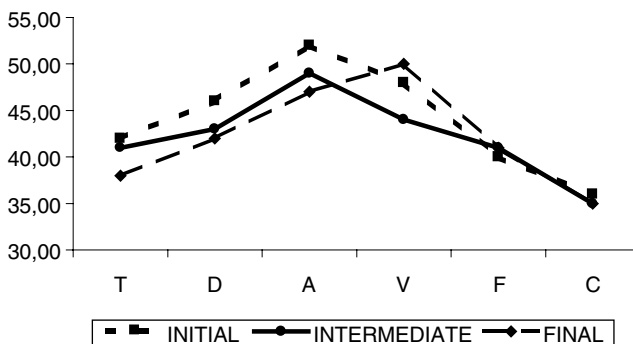


Figure 1. Mood state profile at each moment of assessment during the recovery period.

Table 1
Mean, Standard Deviations, and T Scores in Mood State at Initial, Intermediate, and Final Assessments

POMS	E. Initial			E. Intermediate			E. Final			χ^2	Sig.
	Mean	S.D.	T	Mean	S.D.	T	Mean	S.D.	T		
TMD	125,30	27,40		117,77	23,30		109,75	22,4		12,17	0,002
T	7,40	6,8	42	6,67	4,6	41	5,13	4,5	38	2,81	0,24
D	10,30	10,20	46	5,78	5,5	43	4,69	4,4	42	8,53	0,014
A	11,20	8,1	52	8,89	6,30	49	6,75	4,7	47	8,65	0,013
V	13,70	6,5	48	11,78	5,5	44	15,56	7,3	50	8,64	0,013
F	4,50	4,1	40	5,11	3,8	41	5,38	4,8	41	1,01	0,6
C	3,45	3	36	3,11	2,9	35	3,38	3,3	35	0,86	0,65

Cognitive Response

The results obtained (see Table 2) indicate that as the recovery period progressed, the athletes' subjective estimation of their injury (G.S.) became more pessimistic than during the initial assessment. Nevertheless, these assessments became more positive once again at the end of the recovery period, although they did not prove significant. A more detailed analysis of each of the items contained in this variable shows that the athletes' estimations of the seriousness of their injury (S.I.) tended to increase ($p < 0.5$) as the recovery period progressed, whereas F.F.R and S.T.I.E tended to follow a U-shaped evolution ($p < 0.05$).

Behavioral Response

The results indicate that the injured person's level of adherence tends to decrease ($z = -1.84$; Sig. = 0.06) as the recovery period progresses and the date of the declaration of medical fitness approaches (see Table 3).

Relationship Between Psychological Response and Recovery

The results of this study indicate that the physical and sporting recovery from an injury are closely interrelated (Sig: 0.64, $p < .05$) and also have a statistically significant relationship with each of the different response models assessed (see Table 4).

Subjective Estimation of the Injury and Recovery

The longer the period of time required for both physical and sporting recovery, the greater the subjective estimation made of the injury by the athlete (Physical R: Sig: = 0.60, $p < 0.05$; Sporting R: Sig: = 0.61, $p < 0.05$).

In this study, the data specifically indicate that the time required for physical recovery from the injury was positively related to both the estimation made by the athlete regarding the seriousness of the injury (Sig: 0.74, $p < 0.01$), and his perception of how the injury would interfere with his short-term sporting expectations (Sig: 0.51, $p < 0.05$). Regarding sporting recovery, in addition to the aforementioned variables—estimation of seriousness (Sig: 0.60, $p < 0.05$) and interference with short-term expectations (Sig: 0.63, $p < 0.5$)—it was also observed that the greater the fear of possible future relapse manifested by the injured person, the longer the period of time required for him to regain a level of performance similar to that obtained immediately before the injury.

Mood State and Recovery

The mood state demonstrated by the injured person during the recovery period seems to be more related to physical recovery than to sporting recovery. In this study, only the mean scores obtained for the T mood state factor are related in a statistically significant manner to the period of time that transpired between the date of declaration of medical fitness and the recovery of the level of

Table 2
Mean Scores and Standard Deviations in Subjective Estimation of Injury at Initial, Intermediate, and Final Assessments

SISQ	E. Initial		E. Intermediate		E. Final		χ^2	Sig.
	Mean	<i>S.D.</i>	Mean	<i>S.D.</i>	Mean	<i>S.D.</i>		
G.S.	10,25	3,90	12	3,67	10,69	3,57	2,38	0,30
S.I.	2,35	1,30	2,66	1,32	2,93	1,61	8,46	0,015
S.T.I.E.	3,70	1,34	3,88	1,26	3	1,64	8,27	0,016
L.T.I.E.	2,40	1,42	2,55	1,66	2,62	1,45	1,701	0,42
F.F.R.	1,80	0,9	2,88	0,92	1,93	1,18	13,93	0,001

Table 3
Mean Scores and Standard Deviations in Adherence at Intermediate and Final Assessments

	E. Intermediate		E. Final		z	Sig.
	Mean	S.D.	Mean	S.D.		
Adherence	73,88	24,70	70,62	23,86	-1,84	0,06

performance attained prior to the injury (Sig: 0.52, $p < 0.01$). However, the time that transpired between the injury and the date of declaration of medical fitness is related to both the general mood state (Sig: 0.60, $p < 0.5$) and the levels of tension (Sig: 0.72, $p < 0.5$) and fatigue (Sig: 0.63, $p < 0.005$) demonstrated by the athlete during this period.

Adherence and Recovery

Athletes who demonstrated a lower level of adherence to the rehabilitation program took longer to recover the level of performance obtained prior to the

Table 4
Relationship between Variables Analyzed and Recovery

		Sporting Recovery	Physical Recovery
Physical Recovery		0,64*	
SISQ	G.S.	0,61*	0,60*
	S.I.	0,60*	0,74**
	S.T.I.E.	0,63*	0,51*
	L.T.I.E.	0,24	0,09
	F.F.R.	0,64*	0,22
POMS	TMD	0,36	0,60*
	T	0,52*	0,72**
	D	0,26	0,18
	A	0,27	0,28
	V	0,01	-0,15
	F	0,45	0,63**
	C	0,21	0,12
Adherence		-0,66**	-0,44

* $P < 0.05$; *** $P < 0.01$

injury (Sig: -0.66 , $p < 0.05$). No significant relationship was found between physical recovery and this variable.

Differences in the Injured Person's Psychological Response in Accordance with Recovery

Physical Recovery

The variables in which differences were found between the groups with a fast and slow recovery rate are shown in Table 5. These variables were mood state ($p < 0.05$) and subjective estimation of the injury ($p < 0.05$). Specifically, the mood state factors that were found to differ in a statistically significant manner were fatigue ($p < 0.01$) and tension ($p < 0.05$).

In connection with subjective estimation of the injury, athletes with a shorter physical recovery period obtained lower global mean scores for this factor than those who took longer than the time estimated by the attending doctor ($p < 0.05$), seeing it as less serious ($p < 0.01$) and less likely to interrupt their short-term expectations ($p < 0.05$).

Sporting Recovery

Table 6 shows the differences between athletes who required a shorter sporting recovery time and those who required a longer period. The results indicate that

Table 5
Differences Between Quick and Late Physical Recovery Groups

		Means G1	Means G2	U	Z	Sig.
POMS	TMD	104,18	127,39	10,00	-2,440	0,01
	T	3,40	7,70	12,00	-2,24	0,02
	D	3,88	8,92	18,50	-1,61	0,10
	A	6,86	10,48	24,00	-1,07	0,28
	V	14,96	12,09	23,50	-1,12	0,26
	F	2,73	7,36	5,00	-2,93	0,00
	C	2,49	4,30	22,00	-1,01	0,31
SISQ	G.S.	8,74	11,57	11,00	-2,34	0,01
	S.I.	1,79	3,49	3,50	-3,09	0,00
	S.T.I.E.	2,75	3,92	15,00	-1,97	0,04
	L.T.I.E.	2,28	2,59	28,00	-,37	0,71
	F.F.R.	1,84	2,17	24,00	-1,095	0,27
Adherence		82,77	65,71	18,00	-1,44	0,1

G1: Quick physical recovery group. G2: Late physical recovery group

Table 6
Differences Between Quick and Late Sporting Recovery Groups

		Means G.1	Means G.2	U	Z	Sig.
POMS	TMD	107,60	117,59	20,00	-0,82	0,40
	T	3,97	5,74	16,50	-1,23	0,21
	D	5,00	7,21	20,50	-0,77	0,44
	A	7,22	9,32	24,00	-0,35	0,72
	V	14,83	14,16	25,50	-0,17	0,86
	F	3,4	5,46	18,00	-1,06	0,28
	C	2,8	3,72	17,50	-0,84	0,39
SISQ	G.S.	8,44	11,00	14,00	-1,53	0,12
	S.I.	2,25	2,73	20,00	-0,83	0,40
	S.T.I.E.	2,77	3,79	14,50	-1,49	0,13
	L.T.I.E.	2,05	2,54	20,00	-0,82	0,40
	F.F.R.	1,41	2,47	7,50	-2,33	0,02
Adherence		87,50	65,55	9,00	-2,14	0,03

G1: Quick sporting recovery group; G2: Late sporting recovery group.

such differences are significant in regard to fear of future relapse as a result of the injury ($p < 0.05$) and adherence to the rehabilitation programs ($p < 0.05$), with athletes who were less fearful of future relapse and who showed a greater adherence to the rehabilitation programs being those who recovered more quickly.

Discussion

The first aim of this study was to analyze the psychological response of athletes during the recovery period. The results obtained support the hypothesis that as an injured person recovers, his or her mood state profile grows to resemble the ICEBERG profile, which is characteristic of good performance. These results are coherent with those obtained by Chang and Grossman (1988); Pearsons and Jones (1992); and Ramírez, Alzate, and Lazaro (2002), who observed differences between the mood state profiles of injured and uninjured athletes.

However, during the descriptive analysis of the data obtained, it was observed that vigor tended to decrease immediately after the injury, and then increase once again during the second period until it reached a level higher than that recorded during the initial assessment. The injured person's general mood state improved and his or her level of depression also tended to decrease during the initial period.

In light of the above, the evolution of the emotional response during recovery can be described as follows: After the injury, general mood state becomes

gradually more negative until approximately halfway through the recovery period. As of this moment until the date on which the injured person is declared medically fit, the exact opposite occurs, with the injured person showing an increasingly positive mood state, especially regarding the vigor factor.

These results are consistent with those obtained by McDonald and Hardy (1990), who found that injured athletes obtained moderately higher scores in the anger (A) and depression (D) factors immediately after the moment of injury, and that these negative emotions became less acute as time went by and the rehabilitation progressed. Similarly, the results of this study also support those obtained in a more recent study (Quinn and Fallon 1999), in which the authors observed that the more negative emotions were more acute during the period immediately after the injury, and became less so during the following phases, in which they also observed an increase in positive emotions.

With the second group of variables analyzed, our aim was to assess the fluctuations in athletes' subjective estimation of their injury during the recovery period. The results obtained show that athletes' estimations of the seriousness of their injuries and their fear of future relapse were lower immediately after injury than at the end of the recovery period. All this suggests that during the initial phase of the recovery process, the injured athletes may not be fully aware of the extent of their injuries, and for this reason are not so fearful of future relapse. It also was observed that the more serious the subjective estimation of the injury, the longer the time required for recovery. These findings coincide with the stance taken by Crossman and Jamieson (1985), and Crossman, Jamieson, and Hume (1990), who observed that overestimation of the injury is significantly related to greater pain and a more serious prognosis, as well as to numerous underlying psychological characteristics—such as severe depression, anxiety, and apathy—and that such responses may interfere with the recovery process.

As regards the change that takes place in the injured person's behavioral response, the results obtained from the descriptive analyses indicate that athletes' level of adherence tends to decrease as the recovery period progresses. It is also worth noting that the relationship between this variable and recovery is statistically significant only in the case of sporting recovery, and is not significant in the case of physical recovery. These results may be explained partly by a series of variables that were not taken into account during this study and that have been related in other studies to a low level of adherence—namely, ego-involvement (Lampton, Lambert, and Yost 1993) and trait anxiety (Eichenhofer, Wittig, Balogh, et al. 1986). Nevertheless, in accordance with the considerations indicated by Shelbourne and Foulk (1995), the desire of injured athletes to return to the competitive arena leads them to ignore the established adherence program and to obtain a declaration of medical fitness even when not fully recovered. This may be the reason why athletes obtain a low performance level upon returning to the competitive arena and take longer to regain the level of performance attained prior to the injury, which is the process assessed by the sporting recovery variable.

In summary, we can say that in this study we observed that the psychological response of the athletes to their injuries was inversely related to the period of time required for their physical and sporting recovery. We also found that physical and sporting recovery were positively interrelated, although the variables that were found to be statistically significant in establishing differences between athletes with a longer and shorter recovery period were different for each. In specific terms, the results suggest that athletes with a shorter physical recovery time had a lower level of tension, fatigue, and general mood state than those who took longer to recover, and they also scored lower in subjective estimation of their injury, seeing it as less serious and less likely to interrupt their short-term expectations. Nevertheless, in the case of sporting recovery, the athletes who were less fearful of future relapse and who showed a greater adherence to the rehabilitation programs were those who recovered more quickly.

Furthermore, although there has been an increase in the number of publications focusing on the psychological aspects of sporting injuries over recent years, from our point of view, the return to the competitive arena—and, more specifically, the recovery of the level of performance obtained prior to the injury—is a key moment in the recovery of an injured athlete and should be taken into consideration during future research projects.

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