POST-TRAUMATIC PSYCHOLOGICAL INTERVENTION IN COLLEGE ATHLETES

INTERVENÇÃO PSICOLÓGICA PÓS-TRAUMÁTICA EM ATLETAS UNIVERSITÁRIOS

INTERVENCIÓN PSICOLÓGICA POSTRAUMÁTICA EN DEPORTISTAS UNIVERSITARIOS

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ABSTRACT

Introduction: Injuries will always be with an athlete throughout their career. When analyzing the factors that cause athletic injuries, their coaches usually consider environmental and physical training factors, ignoring psychological factors. Objective: Investigate the mental health status of college athletes after serious injuries during competition, discussing the impact of sports injuries on athletes' mental health. Methods: Twelve college athletes were selected as research volunteers. They were divided into two groups by randomization. The control group was followed by traditional psychotherapy while the experimental group received the post-traumatic mental intervention. A comparison was carried out and mainly the general situation of sports injuries and the effect of intervention treatment were analyzed. The impact of psychological intervention methods on athletes' mental health after injuries were also studied using mathematical statistics to analyze the data. Results: There were significant differences in STAI scores in the experimental group before and after the intervention. BFS scores in the experimental group were significantly higher than those in the control group before and after an intervention. There was no significant difference in the indicators in the control group. Conclusion: Post-traumatic psychological intervention positively affects the mental health recovery of college athletes. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Psychosocial Intervention; Universities; Athletes; Injuries, Sports; Mental Health.

RESUMO

Introdução: Os ferimentos estarão sempre com um atleta durante toda a sua carreira. Ao analisar os fatores que causam as lesões atléticas, seus treinadores geralmente consideram fatores ambientais e de treinamento físico, ignorando os fatores psicológicos. Objetivo: Investigar o estado de saúde mental dos atletas universitários após as lesões graves durante as competições, discutindo o impacto das lesões esportivas sobre a saúde mental dos atletas. Métodos: Foram selecionados 12 atletas universitários como voluntários de pesquisa. Eles foram divididos em dois grupos por randomização. O grupo de controle foi acompanhado pela psicoterapia tradicional enquanto o grupo experimental recebeu intervenção mental pós-traumática. Foi efetuada a comparação e analisada principalmente a situação geral das lesões esportivas e o efeito do tratamento de intervenção. O impacto dos métodos de intervenção psicológica sobre a saúde mental dos atletas após lesões também foi estudado utilizando o método de estatística matemática que é usado para analisar os dados. Resultados: Houve diferenças significativas na pontuação do STAI no grupo experimental antes e depois da intervenção. Os índices de BFS no grupo experimental foram significativamente maiores do que os do grupo de controle antes e depois de uma intervenção. Não houve diferença significativa nos indicadores do grupo de controle. Conclusão: A intervenção psicológica pós-traumática tem um efeito positivo sobre a recuperação da saúde mental dos atletas universitários. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Intervenção Psicossocial; Universidades; Atletas; Lesões Esportivas; Saúde Mental.*

RESUMEN

Introducción: Las lesiones siempre acompañarán a un deportista a lo largo de su carrera. Al analizar los factores que causan las lesiones deportivas, los entrenadores suelen tener en cuenta los factores ambientales y de entrenamiento físico, ignorando los factores psicológicos. Objetivo: Investigar el estado de salud mental de los atletas universitarios después de sufrir lesiones graves durante las competiciones, analizando el impacto de las lesiones deportivas en la salud mental de los atletas. Métodos: Se seleccionaron doce atletas universitarios como voluntarios para la investigación. Se dividieron en dos grupos de forma aleatoria. El grupo de control recibió una psicoterapia tradicional, mientras que el grupo experimental recibió una intervención mental postraumática. Se realizó una comparación y se analizó principalmente la situación general de las lesiones deportivas y el efecto del tratamiento de intervención. También se estudió el impacto de los métodos de intervención psicológica en la salud mental de los deportistas después de las lesiones, utilizando el método de la estadística matemática para analizar los datos. Resultados: Hubo diferencias significativas en las puntuaciones del STAI en el grupo experimental antes y después de la intervención. Las puntuaciones del BFS en el grupo experimental fueron significativamente más altas que las del

grupo de control antes y después de la intervención. No hubo diferencias significativas en los indicadores del grupo de control. Conclusión: La intervención psicológica postraumática tiene un efecto positivo en la recuperación de la salud mental de los deportistas universitarios. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Intervención Psicosocial; Universidades; Atletas; Lesiones en Deportes; Salud Mental.*

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INTRODUCTION

The factors of athletes' sports injuries need to be considered from three perspectives: psychological causes, psychological reactions, and psychological recovery. Although the development of medical technology can significantly reduce the physical recovery time of athletes, the mental state of athletes after physical function recovery may not be good enough. There is a considerable difference between mental and physical recovery. This requires us to pay more attention to the rehabilitation process of athletes. Many academic researchers have systematically discussed the recovery of sports injuries from a psychological point of view and have gradually established relevant theoretical models. Some scholars have established high-level athletes' sports injury recovery theory from the stress-sports injury model.[1] Scholars have established a sports-spirit-society-based sports injury model based on the overall response model of sports trauma. The freestyle knee is the most prone to injury, especially the anterior cruciate ligament of the knee has a long recovery time. This can seriously affect motor function. Relevant experts at home and abroad have conducted a comprehensive study on knee cruciate ligament injury and reviewed postoperative psychological behavior and recovery techniques. In recent years, more and more research on sports injuries has been conducted at home and abroad.

The above theories and methods can help us better understand athletes' physiological state of sports injuries. The above theories can help athletes better deal with psychological recovery after sports trauma. But what are the main idea and ultimate purpose of sports psychology after the above problems are solved? The psychological training and service of sports psychology should improve athletes' functional state and make them achieve excellent performance in competitions.[2] At the same time, coaches should also pay attention to athletes' life-long development and long-term benefits. This suggests that sports psychologists need to look not only at solving current problems but also at the long-term life of the athlete. Most academic content mentioned above is imported from the Western sports world. Because of the vast differences between Chinese and Western cultures, concepts, and sports systems, there are significant differences in Chinese and Western players' thinking patterns, personality characteristics, and expressions. Sports psychology considers social support, preparation, motivation, personality, stress, and anxiety the leading causes of injury in athletes. Although post-traumatic interventional therapy is widely used in diverse groups such as educators and students, there are a few issues related to its use in sports injuries. In this paper, athletes with psychological intervention for injury are used as the research object. Psychological intervention for athletes.[3] To explore the impact of psychological intervention methods on the mental health of athletes. This paper's research results are expected to promote the psychological rehabilitation of sports injuries better.

METHOD

The study is Purely observational studies which no need to registry ID of ICMJE, and all the participants were reviewed and approved by Ethics Committee of Xuchang University, China (NO. 2021051).

General information

This paper divides 12 college sports aerobics players into two groups by randomization. There were no significant differences in the subjects' height, weight, age, and training time.

Investigation method

The control group was treated with conventional mental intervention. It covers social support, goal setting, cognition, mindfulness, relaxation, and more. The experimental group conducted a psychological intervention in commitment behavior and value.[4] Athletes look to the past and engage with the present. The athlete begins to accept the ego and dissociates as the center. Commitment to action means doing the right thing. To be self-seeing means to be fully aware. Values mean that athletes know what makes the most sense. Engagement with the present refers to being in the present moment. Acceptance is an open mind. Dissociation refers to observing the mental state of the athlete himself. Injured players should be guided by the same psychological counselor and determine the duration of their treatment according to different situations. The purpose of this is to improve the mental resilience of athletes. It enables athletes to fully accept their emotions and experiences and improve their quality of life. Psychological intervention is generally five times. Each time is 45 minutes. The frequency is once a week.

Observation index

This paper analyzes the general data on sports injury, the situation of sports injury, and the effect of intervention treatment. This paper uses the State-Trait Anxiety State Scale and the BFS Mood State Scale to analyze the intervention results in the three stages before and after the intervention.[5] This paper sets the time limit for completing the questionnaire to be 10 hours and 20 minutes. STAI is divided into two types, characteristic anxiety, and state anxiety. There are 20 types of these two types of questionnaires. STAI uses a four-point scoring system. There are 40 items in the questionnaire, and the score range is between 20-80. The Feature Anxiety Component Table and the State Anxiety Component Table consist of 10 items. Subjects were positive and negative affective items. The content includes tension, relaxation, fear, etc. In the characteristic anxiety component table, nine items of positive and 11 items of negative affect, respectively. The BFS Emotional State Scale is divided into inactive, depressed, angry, thoughtful, calm, active, happy, and active. The "Sports Injury Situation Table" is rated on a scale of 0 to 56. 0 means no finger injuries were found. One indicates a slight injury to the finger. 2 Apprenticeship is moderate damage. 3 indicates serious injury (non-life threatening). 4 indicates serious injury (life-threatening). And 5 indicates critical injury.

Establishment of sports injury assessment model

Based on many information processing techniques, this paper uses RBF neural network to establish a mathematical model of sports damage assessment. The RBF network consists of an in, hidden, and input layer.[6] This paper expresses the output of the RBF network as:

$$f(r) = \sum_{p=1}^{K} \theta_p \varphi_p(r) \quad (1)$$

K is an illustration of the number of cryptic cells. $r(r_1, r_2,\cdots, r_m)$ specifies an input vector. θ_p represents the connection weights between the output layer and p bit neurons. φ_p describes the p hidden neuron of the output:

$$\varphi_p(r) = e^{-\frac{\|r-\mu_p\|}{\gamma_p^2}} \quad (2)$$

μ_p illustrates a primary vector. B explains the difference. This paper considers the Gaussian function as an efficient function of a hidden layer:

$$G_j(r) = e^{-\frac{|r-\varepsilon_j|^2}{2\gamma_j^2}} \quad (3)$$

$G_j(r)$ indicates that the output is the j hidden node. r represents the network vector in n dimension. ε_j is the description of the core vector of the node in the hidden layer of j. This paper can express the output of this network as:

$$f(r) = \sum_{j=1}^{p} \upsilon_{ij} G_j(r), i = 1, 2, \cdots, m \quad (4)$$

$f(r)$ illustrates the i output stage node of the output. υ_{ij} represents the connection weight from the j hidden node to the i output layer.

Statistical analysis

This paper uses SPSS23.0 statistical software to analyze the data. This paper uses the mean ± standard value method to describe the measurement results that meet the normal distribution. In this paper, a separate t-test was used for group comparisons. This paper used the repeated measurement of variance method to compare each period. Express statistics in the number of columns and percentages.[7] The related methods were used to study the relationship between STAI and BFS psychological status of injured players. The Pearson correlation analysis method was used to study when the average conditions were satisfied. P<0.05 indicates a significant difference between the two groups.

There is no need for a code of ethics for this study.

RESULTS

Comparison of primary data of the two groups of athletes

The data of the two groups of athletes are shown in Table 1. There was no significant difference in gender and exercise level between the two groups of athletes (P>0.05), and the subsequent test data comparison showed good consistency.

STAI scores of two groups of athletes

The STAI scores of the two groups at different times are shown in Table 2. Compared with the control group, the STAI score before and after the intervention was significantly lower than that of the control group (P<0.05). However, there was no significant difference in the STAI score before intervention (P>0.05). There was no significant difference in STAI scores between the experimental groups (P>0.05). However, there was a significant difference in STAI scores between the experimental group during and after intervention (P>0.05).

BFS scores in both projects

The BFS scores of the control group at each period are shown in Table 3. There was no significant difference in the scores of all aspects of BFS before and after the intervention compared to before the intervention (P>0.05).

See Table 4 for the BFS scores of the experimental groups in each period. Compared with before intervention, the BFS scores in all aspects were significantly better than before and after intervention (P<0.05). The scores of other items were significantly higher than those of the control group.

Table 1. Basic data for both groups.

Category		Control group	Test Group	Statistics	P value
Gender	Male	3	3	0.867	0.475
	Female	3	3		
Sport level	First-class athlete	2	2	1.113	0.219
	Secondary athlete	4	4		
Age		21.44±2.21	22.01±0.64	1.365	1.422
Sports	Basketball	1	1	0.903	0.505
	Volleyball	1	1		
	Football	1	1		
	Martial arts	1	1		
	Other	2	2		

Table 2. STAI scores for the two groups.

Category		Control group	Test Group
Before intervention	State anxiety	77.35±6.47	79.29±5.24
	Trait anxiety	62.1±4.2	64.25±5.28
Under intervention	State anxiety	59.34±4.32	40.28±6.25
	trait anxiety	50.27±4.3	36.61±5.23
After intervention	State anxiety	50.5±5.34	24.63±5.38
	Trait anxiety	50.13±6.26	24.64±4.32

Table 3. BFS scores of the control group athletes in each period.

	Before intervention	Under intervention	After intervention
Inactivity	13.12±1.01	11.41±0.88	9.11±0.7
Depressive	22.45±2.14	19.52±1.86	15.59±1.49
Anger	14.24±3.14	12.38±2.73	9.89±2.18
Consideration	21.14±3.22	18.38±2.8	14.68±2.24
Calmness	8.33±3.08	9.36±3.46	10.52±3.89
Activation	4.25±1.36	4.78±1.53	5.37±1.72
Pleasure	3.97±0.69	4.46±0.78	5.01±0.87
Activity	2.56±1.65	2.88±1.85	3.23±2.08

DISCUSSION

After an athlete is injured, it is necessary to conduct psychological counseling according to the athlete's psychological state. This is a good treatment. The results showed no significant difference in STAI scores before and after the intervention in the control group.[8] During and after the intervention, the STAI score of the experimental group was significantly higher than that of the control group. Under different psychological intervention methods, the two groups of STAI scores showed significant differences in different periods. Psychological intervention therapy significantly improved negative emotions towards injured players.[9] The results of this study are consistent with the effects of related psychological interventions at home and abroad. Medical practitioners can take some different therapeutic steps to improve the athlete's mental state in the treatment of PTSD.

Post-traumatic psychological states can severely alter an athlete's personality. The scores of all aspects of BFS before and after intervention were significantly better than those before and after intervention.[10] Post-traumatic depression, anxiety, self-blame, and other aspects are high. Negative emotions such as self-blame, depression, anger, and depression exist. The mood of injured athletes has been significantly improved

Table 4. BFS scores of athletes in each experimental group at each period.

	Before intervention	Under intervention	After intervention
Inactivity	13.39±1.03	9.99±0.77	7.46±0.57
Depressive	22.91±2.18	17.1±1.63	12.76±1.21
Anger	14.53±3.2	10.84±2.39	8.09±1.78
Consideration	21.57±3.29	16.1±2.46	12.01±1.83
Calmness	8.5±3.14	10.12±3.74	12.05±4.45
Activation	4.34±1.39	5.17±1.65	6.15±1.97
Pleasure	4.05±0.7	4.82±0.83	5.74±0.99
Activity	2.61±1.68	3.11±1.91	3.71±2.17

through psychological intervention. The use of PTSD by psychologists during post-traumatic recovery can lead to better emotions and thoughts in athletes following injury and negative experiences. This improves the athlete's mental resilience and improves quality of life.

Psychological interventions should include coping behaviors, social support, stress management skills, psychological skills, and a medical nutrition program. Coping styles include sleep patterns, nutritional habits, time management, etc. The social support system consists of those who care for the athlete and can be counted on. Stress and mental skills include control of arousal, concentration, and efficient thinking in stressful situations.[11] Drugs can affect the athlete's cognition, feeling, physiology, etc., and thus affect the athlete's psychological stress. A lack of ability to deal with emotional repetition is likely to cause severe stress to athletes. For example, players who lack mental conditioning skills are at increased risk of injury when faced with stressful situations. When an athlete does not get along well with his surroundings and lacks the care of his family, he will face a lot of stress. Athletes at the moment are at risk without caring for their peers and family.

When an injury leaves behind players, the most apparent thing an athlete can do is want social help. Before the start of the game, we focused on the care and support of the athletes. Psychiatrists' psychological counseling for athletes can effectively reduce injury harm to athletes. Negative emotions such as anxiety and depression can be relieved by this method, which is beneficial to the positive recovery of athletes. Leisure time outside rehabilitation activities to learn about sports culture can divert athletes from being overly concerned about injuries.[12] This enhances the athlete's cognitive abilities and knowledge, thereby making the athlete's rehabilitation career more fulfilling and rewarding. This helps athletes develop better later in life.

The mental exercise simulates the training content by actively and consciously using the action performance generated in your mind. It can not only make athletes feel their body better and improve their sports memory but also reduce the athlete's anxiety and tension. When the body is injured, the athlete can simulate and practice the technical operation that has been done on the brain.[13] Athletes can watch a video of a successful training session or recall a previous training session. In addition, athletes can also enhance their imagination by listening to songs and doing some relaxing exercises so that athletes can overcome mental obstacles as soon as possible and accelerate physical recovery.

Positive self-suggestion can help players regain confidence and gain an optimistic mood. And positive self-suggestion can promote personal self-esteem and attention control, anxiety control, and the patient's psychological recovery. Athletes can overcome negative emotions, such as depression, anxiety, fear, etc., through positive self-talk during their recovery from injury. This increases the confidence of the athlete. Due to the occurrence of injuries, athletes often show negative emotions in training, so it is necessary to carry out psychological reconstruction to make athletes realize that a negative psychological state is very normal. At the same time, the psychiatrist should also make the athletes aware of the adverse effects of this negative way of thinking on the body's recovery. In addition, the emotional response of the players should be cultivated in training. Psychologists must guide athletes on what kind of action and cognitive style to take in the game. This allows the athlete to integrate movement skills and awareness. It can be used effectively in any situation.

CONCLUSION

Adjusting the mental state of the athlete by a psychologist can effectively reduce the mental burden of the athlete. This reduces the athlete's trait anxiety and state anxiety levels. Psychotherapy for athletes in the post-traumatic mental athlete's rehabilitation process is significant. Sports injuries are often unavoidable. Athletes should carry out effective treatment and rehabilitation training after injury and pay attention to the athlete's psychological state. The recovery after sports trauma should be carried out from both the physical and psychological levels. Psychologists should pay attention to the psychological activities of athletes. Psychologists use psychological theories and methods to carry out effective psychotherapy for athletes.

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REFERENCES

1. Haraldsdottir K, Watson AM. Psychosocial impacts of sports-related injuries in adolescent athletes. Current sports medicine reports. 2021;20(2):104-8.
2. Setyawati H, Rahayu T, Sumekto DR. An Empirical Examination of Elite Athletes' Stress Factors During Joining in the Training Center Program. Pedagogika. 2021;142(2):242-60.
3. Bennett M. Adverse Childhood Experiences and Student-Athlete Mental Health: A Social Work in Sports Perspective. Sport Social Work Journal. 2022;2(1):77-85.
4. Auclair-Pilote J, Lalande D, Tinawi S, Feyz M, De Guise E. Satisfaction of basic psychological needs following a mild traumatic brain injury and relationships with post-concussion symptoms, anxiety, and depression. Disabil Rehabil. 2021;43(4):507-15.
5. Thomson P, Jaque S. Cumulative psychological trauma, emotional regulation, and orthopedic injury in a sample of pre-professional and professional dancers and college athletes. Med Probl Perform Art. 2020;35(2):89-95.
6. Welch K. Psychological interventions help athletes recover from ACL injury. HFJC. 2022;15(2):3-6.
7. Register-Mihalik JK, DeFreese JD, Callahan CE, Carneiro K. Utilizing the biopsychosocial model in concussion treatment: post-traumatic headache and beyond. Curr Pain Headache Rep. 2020;24(8):1-7.
8. Lantz AJ. Pediatric Accidental Trauma: Screening and Reducing Psychological Impact. Pediatr Nurs. 2020;46(3):111-8.
9. Shahoseini M, VaezMousavi M. Mental health in Iranian elite athletes: a 14 year retrospective study. HASES. 2021;1(1):30-41.
10. Bloom GA, Trbovich AM, Caron JG, Kontos AP. Psychological aspects of sport-related concussion: An evidence-based position paper. J Appl Sport Psychol. 2022;34(3):495-517.
11. Belanger HG, Wortzel HS, Vanderploeg RD, Cooper DB. A model for intervening with veterans and service members who are concerned about developing chronic traumatic encephalopathy (CTE). Clin Neuropsychol. 2020;34(6):1105-23.
12. King NS, Coates A. Mixed messages from the 'Mild Traumatic Brain Injury'and 'Sport-related Concussion'literatures: Clinical implications. Brain Inj. 2021;35(4):501-3.
13. Glick ID, Stillman MA, McDuff D. Update on integrative treatment of psychiatric symptoms and disorders in athletes. Phys Sportsmed. 2020;48(4):385-91.