APPLICATION OF PHYSICAL TRAINING IN COLLEGE SOCCER REHABILITATION

APLICAÇÃO DO TREINAMENTO FÍSICO EM REABILITAÇÃO DE FUTEBOL UNIVERSITÁRIO

APLICACIÓN DEL ENTRENAMIENTO FÍSICO EN LA REHABILITACIÓN DEL FÚTBOL UNIVERSITARIO

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ABSTRACT

Introduction: Soccer is a sport with strong rivalry, and participants are prone to various sports injuries in the sporting process. Preventing sports injuries during soccer training is an issue to be considered. Objective: Explore the effect of physical rehabilitation training on preventing sports injuries during college soccer training. Methods: 120 athletes who participated in optional soccer courses were divided into control group and experimental group. The experimental group underwent intervention with 8 weeks of rehabilitative physical training, while the control group did not adopt any interventional measures. Results: After 8 weeks of physical rehabilitative training, the exercise capacity of the athletes in the experimental group was significantly higher than that of the control group who had no rehabilitative training, and the proportion of sports injuries was lower than that of the control group. Conclusion: 8 weeks of physical rehabilitation training can effectively improve the physical mobility ability of soccer players and reduce the veiled danger of injury. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Soccer; Physical Education and Training; Universities.

RESUMO

Introdução: O futebol é um esporte com forte rivalidade, sendo os participantes propensos a várias lesões esportivas no processo esportivo. Prevenir lesões esportivas durante o treinamento de futebol é um problema a ser considerado. Objetivo: Explorar o efeito do treinamento físico de reabilitação na prevenção de lesões esportivas durante o treinamento de futebol universitário. Métodos: 120 atletas que participaram de cursos opcionais de futebol foram divididos em grupo de controle e grupo experimental. O grupo experimental sofreu intervenção com 8 semanas de treinamento físico reabilitativo, enquanto o grupo de controle não adotou nenhuma medida interventiva. Resultados: Após 8 semanas de treinamento de reabilitação física, a capacidade de exercício físico dos atletas do grupo experimental foi significativamente mais elevada do que a do grupo controle que não teve treinamento de reabilitação, e a proporção de lesões esportivas foi menor do que a do grupo controle. Conclusão: 8 semanas de treinamento físico de reabilitação podem efetivamente aperfeiçoar a capacidade de mobilidade física dos jogadores de futebol e reduzir o perigo velado de lesões. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Futebol; Educação Física e Treinamento; Universidades.*

RESUMEN

Introducción: El fútbol es un deporte con una fuerte rivalidad, y los participantes son propensos a diversas lesiones deportivas en el proceso deportivo. La prevención de las lesiones deportivas durante los entrenamientos de fútbol es una cuestión a tener en cuenta. Objetivo: Explorar el efecto del entrenamiento de rehabilitación física en la prevención de lesiones deportivas durante el entrenamiento de fútbol universitario. Métodos: 120 atletas que participaron en cursos opcionales de fútbol se dividieron en grupo de control y grupo experimental. El grupo experimental se sometió a una intervención de 8 semanas de entrenamiento físico rehabilitador, mientras que el grupo de control no adoptó ninguna medida de intervención. Resultados: Tras 8 semanas de entrenamiento de rehabilitación física, la capacidad de ejercicio de los atletas del grupo experimental fue significativamente superior a la del grupo de control que no recibió entrenamiento de rehabilitación, y la proporción de lesiones deportivas fue inferior a la del grupo de control. Conclusión: 8 semanas de entrenamiento de rehabilitación física pueden mejorar eficazmente la capacidad de movilidad física de los futbolistas y reducir el peligro velado de lesión. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Fútbol; Educación y Entrenamiento Físico; Universidades.*

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INTRODUCTION

The characteristics of fierce confrontation and high sports intensity determine that sports injury will inevitably occur in college football training and competition.[1] After the onset of sports injuries, routine treatments are usually done with medication or surgery, reducing training intensity, or arranging training stops to promote athlete recovery. However, the above conventional treatment methods and treatment arrangements are mainly the treatment and rehabilitation strategies

formulated for the injury site, but they do not solve the root cause of the injury.[2] In fact, in college football training, many acute injuries and chronic injuries are related to the athletes' own physical deficiency or physical decline, which is also an important reason why many sports injuries occur near the end of the training period. Although the way of injury treatment solely by medical means is conducive to the rehabilitation of the injury site, it cannot solve the problem of athletes' lack of physical fitness. Athletes may even reduce the training intensity or rest during the treatment.[3]

Rehabilitation refers to the comprehensive and coordinated application of various measures to reduce or eliminate the physical, mental and social dysfunction of the sick, injured and disabled, so as to maintain or reach the maximum functional level, enhance their self-reliance, return to society and improve their quality of life.[4] In China, it was previously believed that rehabilitation and recovery after illness were synonymous, which generally meant that after treatment and rest, health recovered to the level before illness, that is, 100% recovery. In essence, rehabilitation refers to the disability or dysfunction that has been formed after active treatment after injury and illness, and the recovery of health cannot reach the pre disease level, that is, it cannot reach 100% recovery.[5] Although the pathological changes cannot be eliminated, the best functional state can still be achieved after rehabilitation. The concept and connotation of rehabilitation are constantly enriched and improved with the progress and development of society, from a single medical rehabilitation to a "comprehensive rehabilitation" direction.[6] Rehabilitation physical training is obviously different from the way of injury treatment solely by medical means. Rehabilitation physical training is based on the support of rehabilitation medicine, the organic combination of rehabilitation and physical training, not only contributes to the treatment and rehabilitation of sports injury, but also can improve the athletes' physical reserve through long-term daily training, prevent the recurrence of sports injury, rehabilitation and physical training "1 + 1> 2" effect, so that athletes can better adapt to the needs of the special football training and competitive competition.[7] In view of this, this study studies the application of rehabilitation physical training in college football training, in order to verify the application value and application efficacy of rehabilitation physical training in college football training through comparative experiments.[8]

Research object and method

Subjects of study

The subjects of this study were 120 players of the Shantou Polytechnic football team, aged 19-20 years. Based on the results of the questionnaire survey, 106 team members who had experienced a sports injury between 2018 and 2019 were selected as the experimental subjects to carry out the comparison experiment.

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 Zhengzhou Technology and Business University, China (NO. 2022011X)

Research Methods

According to the topic of this study, two sets of questionnaires were designed: "athlete questionnaire" and "expert validity evaluation questionnaire". First, the validity of the "athlete questionnaire" was tested by issuing the expert validity evaluation questionnaire.[9]

In order to have a deeper understanding of the current situation of sports injury of Beijing college student football league players and the characteristics of football injury, we will visit the experts, professors, as well as college football coaches in relevant fields, and listen to their valuable opinions and suggestions to inspire the research ideas.[10]

With Epidata software to the questionnaire data entry, and the data into Excel 2010 and SPSS 17.0 for statistical analysis, analysis using chi-square test, T test, binary classification Logistic regression routine analysis methods of the expected related factors of sports injury, so as to understand the influence of different factors on sports injury, find out the cause of injury.

Experimental group: Before the official start of the comparison experiment, 106 football players who had experienced sports injuries between 2018 and 2019 were randomly divided into the experimental group and the control group, with the same number, with 53 people each.

Pre-experiment test: In order to grasp the basic situation of the participating experimental team members, the functional motion mode screening (FMS) was conducted before the experiment began. In the field of European football sports training, almost all teams use FMS as an important supplement to traditional test training methods to detect potential injury problems in athletes.

Experimental stimulation: During the experiment, the football players in the experimental group conducted rehabilitation physical training twice a week for 50 minutes; the control group did not receive rehabilitation physical training. The content of the rehabilitation physical training of the experimental group of athletes mainly includes muscle strength balance training, core strength training, balance training, stretching training and other main categories. The experiment lasted for a total of 8 weeks.

Post-test: After the 12-week comparison experiment, the participating football players underwent the FMS test again, and the results of the test were compared and analyzed.

Experimental result and analysis

FMS test results of two groups of football players before the experiment

In the FMS test, the athletes' test results are quantified by the four average criteria of 03 points. The pain in some part of the body in the test is 0 points; the athletes cannot complete the whole movement by 1 point; the completion quality is not 2 points; the results of 3 points 0 experiment are shown in Table 1. There was no significant difference between the results measured by the seven basic tests before the start of the comparison experiment. This shows that the level of sports ability and potential risk factors of sports injury in the two groups were basically agreed before the start of the comparison experiment, thus ensuring the comparability between the FMS test results and the reliability of the experimental conclusions after the end of the comparison experiment.

FMS test results of two groups of football players after the experiment

The FMS test results of the two groups of football players in Table 2 were compared with Table 1 and found that after 8 weeks of comparison

Table 1. The FMS test results of the two groups of football players before the experiment.

Test action		Experimental group (n=8)	Control group (n=8)	P value
Squat		1.81±0.35	1.84±0.37	>0.05
Torso stability push ups		1.55±0.41	1.54±0.40	>0.05
Step up	left	1.62±0.60	1.62±0.63	>0.05
	right	1.68±0.49	1.70±0.58	>0.05
Straight Lunge	left	1.75±0.53	1.77±0.52	>0.05
	right	1.73±0.51	1.72±0.56	>0.05
Shoulder flexibility	left	2.50±0.56	2.52±0.55	>0.05
	right	2.52±0.49	2.51±0.53	>0.05
Straight leg active lifting	left	1.97±0.36	1.99±0.39	>0.05
	right	2.00±0.40	2.01±0.38	>0.05
Torsional/rotational stability	left	1.97±0.47	1.96±0.42	>0.05
	right	1.92±0.51	1.93±0.39	>0.05

Note: P> 0.05 represents no significant difference between the results of FMS tests between the two groups: P <0. 05 represents significant difference between FMS test results between the two groups; P <0.01 represents very significant difference between FMS tests between the two groups.

Table 2. The FMS test results of the two groups of football players after the experiment.

Test action		Experimental group (n=8)	Control group (n=8)	P value
Squat		2.23±0.40	1.96±0.42	<0.05
Torso stability push ups		1.97±0.46	1.70±0.50	<0.05
Step up	left	2.19±0.71	1.78±0.52	<0.05
	right	2.18±0.60	1.79±0.57	<0.05
Straight Lunge	left	2.31±0.55	1.89±0.53	<0.05
	right	2.28±0.52	1.85±0.58	<0.05
Shoulder flexibility	left	2.58±0.53	2.57±0.55	<0.05
	right	2.59±0.50	2.56±0.57	<0.05
Straight leg active lifting	left	2.36±0.38	2.10±0.40	<0.05
	right	2.32±0.41	2.04±0.39	<0.05
Torsional/rotational stability	left	2.02±0.38	2.01±0.40	<0.05
	right	2.07±0.42	2.02±0.44	<0.05

Note: P> 0. 05 represents no significant difference between the results of FMS tests between the two groups: P <0. 05 represents significant difference between FMS test results between the two groups; P <0. 01 represents very significant difference between FMS tests between the two groups.

experiment, the FMS test results of both groups showed some changes. The results of the seven basic tests of the two groups were generally improved, but the improvement rate was significantly different. The improvement rate of the football players in the experimental group was greater than that of the football players in the control group. Including: after the experiment, The test results of the two groups of soccer players' squat, trunk stable push-ups, upper step, and straight leg active upper lift were significantly different (P <0. 05), The test results of the football players in the experimental group were higher than those in the control group, And statistically significant: the test results of the two groups were very significant (P <0.01), The test results of football players in the experimental group were significantly higher than that of the control group; at the same time, Results of two tests of shoulder flexibility and torsion / rotation stability in both groups, Although improved compared to the experiment, However, there was no significant difference between the two athlete groups after the experiment (P> 0.05), It is not statistically significant . Several tests, including squat, trunk stable push-ups, upper step, straight leg initiative, straight lunge, mainly focus on evaluating the movement ability of the lower limbs; the shoulder movement range, bilateral symmetry and shoulder pain risks, and the torsion / rotation stability is the stability of multiple surfaces and the symmetry on the two sides of the upper and lower limbs. According to the above analysis, the physical exercise ability of the experimental group of football players, especially in the lower limbs, was significantly higher than that of the control group. This shows that the application of rehabilitation physical fitness training in college football sports training is helpful to improve the physical sports ability of football players and reduce the hidden danger of injury.

Results analysis and discussion

It can be seen from the experimental results that the application of rehabilitation physical training in college football training is helpful to improve the body and sports ability of football players, especially to improve the sports ability of their lower limbs and reduce the hidden danger of injury. Figure 1 shows the injury mechanism of a football player, that is, the specific injury situation, such as the opponent's rough action, the wrong technical action, the damage caused by the ball kick, etc., in order to avoid similar accidents.

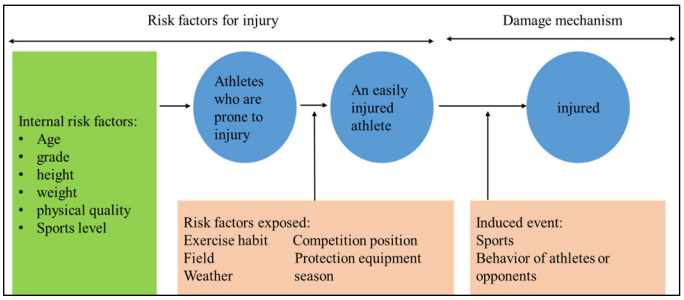

Figure 1. Causality pattern of injury in college Football League.

This conclusion is mainly because: (1) muscle balance training in rehabilitation physical training, pay attention to the training and development of small muscle groups, and targeted training of muscle coordination, sex and muscle fiber characteristics; (2) rehabilitation, core strength training in sexual physical training can strengthen the stability of athletes, abdominal muscles, back muscles and pelvis. After the stability of the athletes' body center improves, Not only will the efficiency of power transmission between the upper and lower limbs will improve accordingly, At the same time, it can effectively avoid technical movements are not standard or upper and lower limb movements disconnect, Reduce potential damage hazards, Reduce the occurrence of injury; (3) Balance force training in rehabilitation physical training, By strengthening the joint stability and proprioceptive response capacity of the joints, Not only can improve the physical athletic ability of athletes, Especially the exercise ability of the lower limbs, It can also effectively reduce the incidence of sports injury in sports training.

CONCLUSIONS

The application of rehabilitation physical training can effectively improve the physical sports ability of football players and reduce the hidden danger of injury in colleges and universities. College football teachers and coaches should actively carry out the application practice of rehabilitation physical training in college football training, and constantly accumulate the beneficial experience in carrying out rehabilitation physical training. Stretch training in rehabilitation physical training, It can relax stretched muscles or soft tissues, Avoid muscle fatigue, Reduce the likelihood of problems such as muscle strain. At the same time, the muscles on both sides of the joint that affect the stability of the joint because of muscle tension, So as to achieve the effect of balancing the left and right muscles of the athletes, Make the development of the muscles on both sides of the athlete more balanced, More adequate.

The author declare no potential conflict of interest related to this article

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