RUNNERS SPORTS INJURIES AND REHABILITATION

LESÕES ESPORTIVAS E REABILITAÇÃO EM PRATICANTES DE CORRIDA

LESIONES DEPORTIVAS Y REHABILITACIÓN EN CORREDORES

ORIGINAL ARTICLE
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ABSTRACT

Introduction: Independent athletes and sports enthusiasts are subject to injuries due to several factors, such as neglect of physical preparation, lack of knowledge of the evolutionary progression of load intensity, and deficient stretching. Running is a popular sport in China, and the knowledge of the injuries caused by this group of fans may guide awareness behaviors to prevent accidents in sports practice. Objective: Evaluate the injuries and rehabilitation of runners. Methods: A total of 265 ordinary chinese runners (166 men) were selected as research subjects. Information on running sports injury characteristics, subjective perception of the causes of runners' injuries, prevention and rehabilitation methods in runners' injuries were evaluated. Results: The knee joint has the highest proportion of injuries (26.73%), followed by foot injuries (13.11%) and ankle injuries (10.65%). Pain after exercise was reported by 38.12% of the runners, while 21.89% felt pain during the race. Conclusion: Warm-up exercises are recommended before sports practice. Protective equipment can reduce the probability of injuries. Such equipment is considered a method of treatment and prevention with greater satisfaction and better adherence among runners. ***Evidence Level II; Therapeutic Studies - Investigating the result.***

Keywords: Running; Sports; Athletic Injuries.

RESUMO

Introdução: Atletas independentes e entusiastas esportivos estão sujeitos a lesões por vários fatores como negligência do preparo físico, desconhecimento na progressão evolutiva de intensidade de carga e alongamentos deficitários. A corrida é um esporte popular na China e o conhecimento das lesões ocasionadas nesse grupo de adeptos poderá guiar condutas de conscientização para a prevenção de acidentes na prática esportiva. Objetivo: Avaliar as lesões e a reabilitação nos praticantes de corrida. Métodos: Um total de 265 corredores comuns chineses (166 homens) foram selecionados como objetos de pesquisa. Foram avaliadas as informações sobre as características das lesões esportivas de corrida, a percepção subjetiva das causas das lesões dos corredores, métodos de prevenção e reabilitação nas lesões dos corredores. Resultados: A articulação do joelho apresenta a maior proporção nas lesões (26,73%), seguida por lesões nos pés (13,11%) e tornozelos (10,65%). Dores após o exercício foram relatadas por 38,12% dos corredores enquanto 21,89% dos corredores sentem dor durante a corrida. Conclusão: Recomenda-se a realização de exercícios de aquecimento antes da prática esportiva. Os equipamentos de proteção podem reduzir a probabilidade das lesões. A utilização desses equipamentos é considerada um método de tratamento e prevenção com maior satisfação e melhor adesão entre os corredores. ***Nível de evidência II; Estudos Terapêuticos - Investigação de Resultados.***

Descritores: *Corrida; Esportes; Traumatismos em Atletas.*

RESUMEN

Introducción: Los atletas independientes y los entusiastas del deporte están sujetos a lesiones por varios factores como la negligencia en la preparación física, la falta de conocimiento en la progresión de la intensidad de la carga y los estiramientos deficientes. La corrida es un deporte muy popular en China y el conocimiento de las lesiones causadas en este grupo de aficionados puede orientar las conductas de concienciación para la prevención de accidentes en la práctica deportiva. Objetivo: Evaluar las lesiones y la rehabilitación en los practicantes de corrida. Métodos: Un total de 265 corredores chinos ordinarios (166 hombres) fueron seleccionados como sujetos de la investigación. Se evaluó la información sobre las características de las lesiones deportivas de los corredores, la percepción subjetiva de las causas de las lesiones de los corredores y los métodos de prevención y rehabilitación en las lesiones de los corredores. Resultados: La articulación de la rodilla es la que presenta la mayor proporción de lesiones (26,73%), seguida por las del pie (13,11%) y las del tobillo (10,65%). El 38,12% de los corredores declararon dolor después del ejercicio, mientras que el 21,89% de los corredores sintieron dolor durante la carrera. Conclusión: Se recomienda realizar ejercicios de calentamiento antes de la práctica deportiva. El equipo de protección puede reducir la probabilidad de lesiones. El uso de estos equipos se considera un método de tratamiento y prevención con mayor satisfacción y mejor adherencia entre los corredores. ***Nivel de evidencia II; Estudios terapéuticos - Investigación de resultados.***

Descriptores: *Carrera; Deportes; Traumatismos en Atletas.*

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INTRODUCTION

Athletes and sports fitness enthusiasts, in daily training competitions and sports fitness, there are roughly three types of pain to experience. The first is in daily training and competition, pain that exceeds the physical limits of the body; The second type refers to the pain caused by injuries during training and competition;[1] The third type refers to after training and competition are over, due to various reasons, it lasted until the next training and the pain during the game. Athletes and sports fitness enthusiasts, improper handling of these three types of pain, it is very easy to cause damage to the body, and cause the accumulation of body injuries, lead to the disorder of internal environment function and the decline of immunity, there are a series of sports symptoms, in severe cases, organic and functional lesions may also appear.[2] And among these three kinds of pain, in the third type of pain, sports muscle micro-damages after exercise are the most common.[3] Athletes and sports enthusiasts due to high-intensity competition or training, will cause a short-term decline in muscle function and muscle performance. This decline may be a short process after the competition training, appear for a few minutes or a few hours; It may also be a long-term process, which lasts for several days after the competition training.[4] This kind of muscle damage caused by exercise, it will cause the disorder of muscle function and the decline of muscle performance, at the same time, it will be accompanied by the reduction of the body's range of motion, muscle swelling, inflammation, physiological and biochemical reactions such as increased muscle soreness.[5] In response to this research question, Neeki M M et al. established a complete muscle injury model, the sports muscle micro-injury is divided into four stages: The initial stage, the spontaneous stage, the phagocytic stage, and the regeneration stage, these stages are intertwined and interrelated.[6] The initial stage is caused by factors such as mechanical stretching and metabolism, then there was a loss of calcium balance in the spontaneous phase, the phagocytic phase usually occurs 4-6 hours after exercise, lasts 2-4 days.[7] On the basis of current research, the author proposes to evaluate the effect of running on sports injuries and rehabilitation, select Chinese runners, carry out the questionnaire adjustment method, carry out related analysis on the injury and prevention of running sports, the results showed that: 38.12% of runners suffered from sports injury pain, which appeared after exercise, secondly, 21.89% of runners have pain during running. 45.30% of runners had better pain in the area of sports injury, there was no worsening of the pain in the injured area of the runner.

METHOD

Research objects

The subjects of the survey questionnaire are ordinary Chinese runners, with a total of 265 people, there are 166 male runners and 99 female runners.

Research methods

By consulting information and books related to running sports injuries, integrating the opinions of experts, running coaches and running enthusiasts, design and formulate a questionnaire "Questionnaire for Running Enthusiasts". The questionnaire is divided into runners, personal situation, basic running information, injury situation 3 parts content. Surveyed runners, can open the questionnaire through your computer or mobile phone, and fill it out quickly and easily. At the same time, it is not restricted by geographical conditions, runners' physical health and filling time. Runners must complete all the questions in the questionnaire to complete the submission, each mobile phone or computer IP address can only submit a complete answer once. If there is a common sense error in the questionnaire, when answering multiple questions that are logically coherent, as a result, there were inconsistencies and errors, etc., the questionnaire is regarded as invalid.[8] After that, the completed and submitted questionnaires were screened on the online questionnaire platform, and Excel2016 was used for summary statistical analysis.

RESULTS

The use of sports protective equipment for runners

In this survey, for runners when they are running, investigate the use of sports protective equipment, because runners wear one or more sports protective equipment, therefore, the statistics are based on the number of people who choose to wear sports protective equipment, as shown in Table 1, the report shows a total of 278 people, 71.61% of runners did not wear sports protective equipment, knee pads are the most sports protective equipment worn by runners, the proportion of which is 17.37%, and the proportion of women wearing knee pads is higher than that of men, at 26.99%.

Characteristics of running sports injuries

In this survey, there may be one or more injuries to the runners, therefore, statistics are made according to the number of people selected at the injury site, as shown in Table 2, the report shows a total of 329 people, among them, the knee joint has the largest number of injuries, and its proportion is 26.73%, followed by the foot and ankle joints, the proportions were 13.11% and 10.65% respectively. It can be seen that most of the injuries of the runners are concentrated in the lower limbs, the proportion of people with lower limb injuries was 50.5%. Among them, the proportion of runners without sports injuries was 37.1%.

38.10% of runners suffer from sports injury pain, which appears after exercise, secondly, 21.91% of runners have pain during running. 45.30% of the runners experienced improvement in pain at the injury site, and no runners experienced increased pain at the injury site. (Table 3)

Injury prevention and rehabilitation of runners

The results of this survey, runners' prevention methods and rehabilitation of sports injuries, as shown in Figure 1, 43.36% of the people used traction to have a rehabilitation effect of 34%, 19.25% the rehabilitation effect of using the foam roller is 25%, the rehabilitation effect of 8.85% of people wearing protective gear is 61%, and 18.36% of the rehabilitation effect of wearing professional sports equipment is 42%.

Table 1. Statistics on the use of sports protective equipment by runners during running.

Index	Index sub-items	Total people	Number of men	Number of women
Wear sports protective equipment for long runs	Ankle support	13	8	4
	Knee pads	47	21	27
	Elbow pads	7	5	2
	Don't wear	200	133	66
	Other	11	6	6

Table 2. Injury sites of runners.

Index	Index sub-items	Total people	Number of men	Number of women
Injury site	Head and neck	6	6	0
	Shoulder	8	8	0
	Upper limb	1	1	0
	Trunk	7	3	4
	Knee joint	87	57	31
	Ankle joint	34	35	10
	Foot	44	31	12
	Other	19	7	11
	No sports injuries	123	72	50

Table 3. Statistics of the occurrence and recovery of sports injury and pain of runners.

Index	Index sub-items	Total people
Sports injury special cases	Before exercise	9
	In motion	57
	After exercise	100
	Appears only when doing certain actions	39
	Appear in the morning or at night	6
	Appears with the weather	11
	Other	42
Recovery of the injured site	Get better	121
	Aggravate	0
	Ineffective, but healed himself after a while	50
	The situation is too complicated to describe	15
	No sports injuries	80

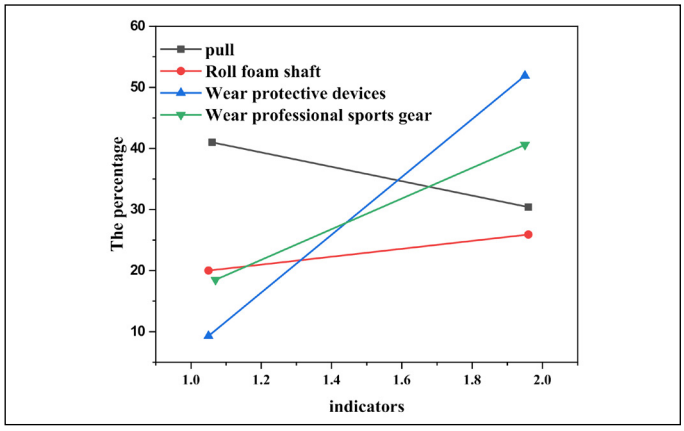

Figure 1. Injury prevention and rehabilitation of runners.

DISCUSSION

Analysis of characteristics of running sports injuries

According to the survey results, the injury rate of runners was 62.89%, most of the injuries are concentrated in the lower extremities, the most common part of sports injuries is the knee joint, followed by the feet and ankle joints, the number of cases of lower limb injuries accounted for 50.39%. Studies have shown that, the incidence rate of lower limb injuries of long-distance runners is 81.29%, this study is much lower than its injury rate, probably because, the runners in this study, the reason for the longer running age, have a richer running experience. And another research report on 4006 amateur runners of different levels with running habit, the results are close to 0, its research shows that runners have a higher running injury rate, the high incidence of injuries is the knees and ankles. Compared with walking, the proportion of the support period has been shortened from 60% to 30%, at the same time, each step needs to bear the impact of about 3 times the body weight, the injury of the lower limbs is closely related to the peak impact force and load rate when landing. Increased requirements for lower limb ability, which may be a common cause of lower limb injuries. For most runners, the pain of sports injury occurs during and after exercise. This may be related to the lack of adequate and scientific warm-up and relaxation, most runners warm up for less than 10 minutes before running, and the warm-up activities are mainly stretching and jogging. The warm-up activities during exercise should include two parts, the general warm-up activities, Such as jogging or jumping for 5-10 minutes, and special warm-up activities, such as 8-12min dynamic stretching, etc., therefore, the runner's warm-up time and method are insufficient. Although they spend time relaxing after running, compared to warming up a bit longer before running, more than half of the runners' relaxation time after running is still less than 10 minutes.[9]

Analysis of the subjective consciousness of runners' rehabilitation

Excessive exercise load, lack of reasonable preparation activities, movement technical errors are the three main factors that runners believe to cause sports injuries.[10] With the spread of scientific sports information, most runners will pull and use foam rollers, wear professional sports equipment to prevent injuries, but there are still a small number of runners who do not prevent them. The runner's attitude towards pulling has always been very positive, stretching seems to have become a habit of runners. Knee pads are the most popular in sports protective equipment, and the proportion of women wearing knee pads is higher than that of men, it may be because of the high risk of knee injury, knee pads can limit the trajectory of poor patella movement, thereby preventing the occurrence and development of patellofemoral pain syndrome. Compared with the use of protective gear, it is considered to be the treatment and prevention method with the highest satisfaction and the best compliance for runners.

CONCLUSION

The author proposes an evaluation of the effect of running on sports injuries and rehabilitation, and selects Chinese runners, carry out the questionnaire adjustment method to analyze the running injury and prevention related to it, the results showed that 38.12% of runners suffered from sports injury pain after exercise, secondly, 21.89% of runners have pain during running. 45.30% of the runners had better pain at the injury site, and no runners experienced aggravation of the pain at the injury site.

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REFERENCES

1. Kotler DH, Babu AN, Robidoux G. Prevention, Evaluation, and Rehabilitation of Cycling-Related Injury. Current Sports Medicine Reports. 2016;15(3):199-206.
2. Korley FK, Kelen GD, Jones CM, Diaz-Arrastia R. Emergency Department Evaluation of Traumatic Brain Injury in the United States, 2009-2010. The Journal of Head Trauma Rehabilitation. 2016;31(6):379-87.
3. Mirmoradi SH, Ehrlich M, Dieguez C. Evaluation of the combined effect of toe resistance and facing inclination on the behavior of GRS walls. Geotextiles & Geomembranes. 2016;44(3):287-94.
4. Mangum LC, Sutherlin MA. Reliability of Ultrasound Imaging Measures of Transverse Abdominis and Lumbar Multifidus in Various Positions. Pm & R. 2016;8(4):340-7.
5. Chrif F, Nef T, Hunt KJ. Investigation of cardiopulmonary exercise testing using a dynamic leg press and comparison with a cycle ergometer. BMC Sports Science, Medicine and Rehabilitation. 2018;10(1):1-11.
6. Neeki MM, Dong F, Liang L, Toy J, Carrico B, Jabourian N et al. Evaluation of the effect of methamphetamine on traumatic injury complications and outcomes. Addiction Science & Clinical Practice. 2018;13(1):1-7.
7. Winberg C, Flansbjer UB, Rimmer JH. Lexell J. Relationship Between Physical Activity, Knee Muscle Strength, and Gait Performance in Persons with Late Effects of Polio. PM & R: The Journal of Injury, Function and Rehabilitation. 2015;7(3):236-44.
8. Weintraub A, Natale A, Tefertiller C, Eagye C, O'Dell D, Ketchum JM et al. Comparison of the Sensory Organization Test and Balance Evaluation Systems Test in Traumatic Brain Injury. Archives of Physical Medicine and Rehabilitation. 2018;99(11):e132-3.
9. Bisson L, Zivaljevic N, Sanders S, Pula D. A cost analysis of single-row versus double-row and suture bridge rotator cuff repair methods. Knee Surgery Sports Traumatology Arthroscopy. 2015;23(2):487-93.
10. Ravi S. Customised Sport Injury Rehabilitation with Yoga and Physiotherapy for Acl - 12week Rehabilitation Progress of an Injured Young Alpine Skier. British Journal of Sports Medicine. 2016;50(22):e4.18-e4.