PREVENTION OF PHYSICAL INJURIES IN OUTDOOR SPORTS PRACTITIONERS

PREVENÇÃO DE LESÕES FÍSICAS EM PRATICANTES DE ESPORTES AO AR LIVRE

PREVENCIÓN DE LESIONES FÍSICAS EN LOS PRACTICANTES DE DEPORTES AL AIRE LIBRE

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ABSTRACT

Introduction: Outdoor sports are a recreational sports, and mountaineering and hiking are the basic forms of this sport. Occasionally there are injuries in the practice of this activity that can damage the health of its practitioners, in addition to bringing adverse effects to the daily work environment. Objective: Provide relevant protection measures to prevent physical injuries caused to outdoor sports practitioners. Methods: Volunteer exercisers participated in a questionnaire survey that collected the location of sports injuries and the causes of these injuries. On this information, statistics were processed considering the location of the injuries and their causes. Protective measures were based on the updated scientific literature. Results: The most injured body parts in outdoor sports are ankle joints, knee joints, and skin tissue contusions. The main reason for these injuries is the lack of awareness of protection by the athletes. Conclusion: Attention to preparation activities before outdoor sports and organization in the exercise load are the main factors for preventing physical injuries in outdoor sports practitioners. In this way, injuries can be avoided in outdoor sports. ***Level of evidence II; Therapeutic studies - investigation of treatment outcomes.***

Keywords: Injuries, Sports; Athletes; Sports; Physical Conditioning, Human.

RESUMO

Introdução: O esporte ao ar livre é uma atividade recreativa sendo o montanhismo e a caminhada as formas básicas. Ocasionalmente há lesões na prática dessa atividade que podem prejudicar a saúde de seus praticantes, além de trazer efeitos adversos para o ambiente de trabalho diário. Objetivo: Fornecer medidas de proteção relevantes para a prevenção de lesões físicas ocasionadas em praticantes dos esportes ao ar livre. Métodos: Voluntários praticantes participaram de um método de pesquisa por questionário que coletou a localização de lesões esportivas e as causas dessas lesões. Sobre essas informações, foram processadas estatísticas considerando o local das lesões e suas causas. As medidas de proteção foram baseadas na literatura científica atualizada. Resultados: As partes corporais mais lesionadas no esporte ao ar livre são a articulação do tornozelo, a articulação do joelho e contusões do tecido cutâneo. A principal razão dessas lesões é a falta de conscientização da proteção por parte dos atletas. Conclusão: Atenção às atividades de preparação antes dos esportes ao ar livre organização na carga de exercícios são os principais fatores para a prevenção de lesões físicas em praticantes de esportes ao ar livre. Desta forma, as lesões podem ser evitadas nos esportes ao ar livre. ***Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.***

Descritores: *Lesões Esportivas; Atletas; Esportes; Condicionamento Físico Humano.*

RESUMEN

Introducción: El deporte al aire libre es una actividad recreativa siendo el montañismo y el senderismo sus formas básicas. En ocasiones se producen lesiones en la práctica de esta actividad que pueden perjudicar la salud de sus practicantes, además de traer efectos adversos al entorno laboral diario. Objetivo: Establecer medidas de protección relevantes para la prevención de las lesiones físicas causadas en los practicantes de los deportes en el arco electrónico. Métodos: Profesionales voluntarios participaron en un método de encuesta por cuestionario que recogía la localización de las lesiones deportivas y las causas de las mismas. A partir de esta información, se procesaron las estadísticas teniendo en cuenta la localización de las lesiones y sus causas. Las medidas de protección se basaron en la literatura científica actualizada. Resultados: Las partes del cuerpo más lesionadas en el deporte al aire libre son la articulación del tobillo, la articulación de la rodilla y las contusiones del tejido cutáneo. La razón principal de estas lesiones es la falta de conciencia de protección por parte de los deportistas. Conclusión: La atención a las actividades de preparación antes de la organización de deportes al aire libre en la carga de ejercicio son los principales factores para la prevención de lesiones físicas en los practicantes de deportes al aire libre. De este modo, se pueden evitar las lesiones en los deportes al aire libre. ***Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.***

Descriptores: *Traumatismos en Deportes; Atletas; Deportes; Acondicionamiento Físico Humano.*

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INTRODUCTION

Outdoor physical activity is an activity aimed at recreation. It is a sport that combines leisure, tourism, and sports.[1] The main body of this sport is not competitive. Climbing and hiking are effective forms of outdoor activity. The event was well-received by all entrants. Sports athletes' poor self-protection ability and improper training methods will cause sports injuries. Therefore, how to effectively prevent sports injuries in outdoor activities has become a common concern.[2]

METHOD

Research objects

This paper takes 80 players as the experimental sample. This article is a study of athletes in sports injuries. There are 80 questions in this study. A total of 80 questionnaires were collected this time. The recycling rate is 100%.[3]

Amplitude simulation of sports injury and joint activity

Because of the high predictive ability of the vector machine algorithm, this paper uses the vector machine algorithm to model it.[4] The vector machine algorithm constructs the optimal hyperplane under the condition. The training set is decomposable:[5]

$$a(\vec{\omega} g\varphi(x)) + b = 0 \quad (1)$$

This optimal hyperplane must not only meet the following constraints:

$$\frac{y_i[(\vec{\omega} g\varphi(x_i)) + b]}{a} \geq 1 \quad (2)$$

We also want to minimize the following function:

$$\varphi(\vec{\omega}) = \frac{1}{2}\left\| \frac{a\vec{\omega}(x_i) + b}{y_i} \right\|^2 \quad (3)$$

The optimal hyperplane can be obtained by solving the optimization problem:

$$a_0 k(\frac{y_i, y}{x_i, x}) + b_0 = 0 \quad (4)$$

The Lagrange multiplier is a_0; the kernel function is $k(\frac{y_i, y}{x_i, x})$.
There is no need for a code of ethics for this type of study.

RESULTS

The incidence of sports injuries among outdoor sports participants

It can be seen from Table 1 that the injury incidence rate of male athletes in outdoor activities is 11.43% higher than that of female athletes. And 40% of all male athletes surveyed had suffered a sports injury. This suggests that male athletes are more likely to be injured than female athletes during outdoor activities. At the same time, men are more physically active.[6] This is because male athletes show higher enthusiasm for outdoor activities. Female athlete runners are more flexible in high-risk sports. Female athletes have a higher awareness of safety and self-protection. As a result, female athletes participating in outdoor activities are less likely to be injured.

Sports injury site of outdoor sports participants

Twenty-eight people had sports injuries (Table 2). Male athletes are more vulnerable and suffer more injuries than female athletes. Male athletes are likely to experience multiple and repetitive injuries. First, men's understanding of rehabilitation and treatment after an injury is relatively weak.[7] Some people don't care about getting hurt. They thought that their bodies would get better as long as they had a good rest. This is likely to cause repeated injury to the wound. Ankle injuries, for example, are an everyday outdoor activity. Most athletes are unaware of ankle injuries. The players returned to their training sessions after days off. Long-term instability can lead to severe sprains. In addition, more men are participating in outdoor activities. Male athletes do more exercise and competition. It is more likely to have multiple sports injuries.

Occasions of sports injuries of outdoor sports participants

Injury incidents in outdoor activities vary widely. These contestants are all field teams from various countries, provinces, and cities. It has high requirements on the technical level of the players.[8] Due to the complex field conditions, athletes cannot avoid sports injuries when performing sports such as field running in the wild. (Table 3)

Sports injuries of outdoor sports participants

Trail running and downhill are the most injured in sports competitions. High-intensity running on rough terrain can lead to sports injuries.[9] On steep descents, the athlete can become rigid due to excessive stress, leading to hand fatigue and leg injury. Athletes tend to ignore the complex environment when they land fast, causing scratches and nicks. It may also be caused by the poor handling skills of the players during the landing buffer. (Table 4)

Causes of sports injuries among outdoor sports participants

Inadequate prep activity during outdoor workouts is the single most important cause of injury.[10] This is due to the lack of grasp of detail in the training process by coaches and players. Although the outdoor sports teams will conduct some pre-match preparations, there is not much professionalism in the pre-match preparation work. There was also a high proportion of sports injuries due to technical manipulation errors and problems with field equipment (Table 5).[11]

Table 1. Incidence of sports injuries among participants in outdoor sports.

	n	Proportion (%)	have a sports injury	Damage rate (%)
Male	45	56.25	18	40
Female	35	43.75	10	28.57

Table 2. Statistics of sports injuries of outdoor sports participants.

Injury site	Male		Female		Total	
	n	Proportion (%)	n	Proportion (%)	n	Proportion (%)
Shoulder joint	4	2.22	2	20.00	6	21.43
Elbow joint	3	16.67	2	20.00	5	17.86
LOL	2	11.11	1	10.00	3	10.71
Knee joint	4	22.22	3	30.00	7	25.00
Ankle joint	5	27.78	1	10.00	6	21.43
Head	6	33.33	1	10.00	7	25.00
Waist	4	22.22	2	20.00	6	21.43
Other	1	5.56	2	20.00	3	10.71

Table 3. Statistics on the occurrence of sports injuries among outdoor sports participants.

Injury Occurrence	n	Proportion (%)
Train	15	53.57
Contest	13	46.43

Table 4. Statistics on sports injuries of outdoor sports participants.

Project	n	Proportion (%)
Trail running	8	28.57
Downhill	7	25.00
Rock climbing	4	14.29
On foot	4	14.29
Sling	3	10.71
Other	2	7.14

Table 5. Statistics on the causes of sports injuries among outdoor sports participants.

Reason	Male		Female	
	n	Proportion (%)	n	Proportion (%)
Insufficient preparation activities	8	44.44	3	30.00
Technical error	4	22.22	2	20.00
Poor physical fitness	3	16.67	2	20.00
Poor physical condition	0	0.00	1	10.00
Nervous or timid	0	0.00	1	10.00
Against the rules	1	5.56	1	10.00
Venue equipment problem	2	11.11	0	0.00
Improper protection	0	0.00	0	0
Other	8	44.44	3	30.00

DISCUSSION

Adequate preparation activities

The purpose of the preparatory exercise is to better the joints and muscles participating in the exercise. This increases their flexibility and extensibility. At the same time, the exercise increases the athlete's body temperature and reduces stickiness during exercise. This reduces the chance of sports injuries.[12] Most of the experiments show that proper preparation can reduce muscle strain and prevent sports injuries. Because outdoor sports have their particularities, it is necessary to prepare accordingly for various sports.

Field trips are required before outdoor sports

Before conducting field training, coaches need to conduct field surveys, especially those places that have never been visited. The coaches need to learn about the local customs, vegetation distribution, topography, traffic conditions, river distribution, climate, etc.[13] All these must be planned accordingly, and the route map and campsite must be drawn up. Coaches have to learn to face possible emergencies. Instructors must fully grasp the meteorological conditions on-site and the climatic characteristics of local forests and take corresponding protective measures. In addition, the coach should conduct a comprehensive and accurate assessment of the athlete's physical condition and physical function before departure.[14] Some injured or recently recovered female athletes need to be banned from outdoor physical activity. Especially before long-distance and challenging field practice courses, relevant research work should be done well. In addition, the trainer shall overhaul the equipment required for the field operation. Instructors must select appropriate clothing, shoes, and necessary seam protection according to climatic conditions and site characteristics.

Strictly organize and make corresponding guarantees

The trainer has to arrange every training session. Don't have too many students or too many players in each training session. Coaches should have experienced and responsible coaches to lead them. Before climbing the mountain, the coach should do enough exercise, practical training, and proper rest. This prevents physical exertion. Each team should be in touch at all times. When the field instructor organizes the team leader, let the male athletes assist the female athletes more.[15] Coaches should also communicate with local health and rescue organizations and have emergency and sports injury prevention medicines available. In addition, coaches have to strengthen logistics. In this way, the female players are provided with the necessary material support and increased equipment. At the same time to strengthen the professional training of coaches. In each coach and player going out, the logistics department will provide them with insurance and accident insurance.

Choose the right route

If you need to crawl for a long time while climbing or walking, take a 2-3 minute rest after 20 minutes of climbing. This can reduce the extra load on the knees from continuing to climb and reduce the wear and tear of the knees. The selection of roads should be based on flat roads. Rough roads can increase knee torque and increase knee wear.[16]

CONCLUSION

Ankle, wrist, shoulder, knee, and elbow are the most common sports injuries. Lack of adequate preparation and technical operation errors are essential factors leading to injuries to athletes. In response to the causes of outdoor sports injuries, the logistics department should take corresponding preventive measures and do an excellent job in the health education of athletes and coaches. They require regular overhaul and maintenance of equipment. This provides a suitable environment for outdoor activities. Coaches should regularly check field equipment and teach about sports injuries before training begins. In sports, we should pay attention to sports norms, attention to safety, and the reasonable distribution of exercise. Coaches improve athletes' ability to prevent sports injuries and do corresponding special training. Athletes need to strengthen the common sense of first aid for sports injuries. They need to practice according to the coach's instructions to improve their proficiency in the movement.

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