

SAFETY AND PREVENTION OF SPORTS INJURIES IN POPULAR ICE AND SNOW SPORTS

SEGURANÇA E PREVENÇÃO DE LESÕES ESPORTIVAS EM ESPORTES POPULARES NO GELO E NEVE

SEGURIDAD Y PREVENCIÓN DE LESIONES DEPORTIVAS EN LOS DEPORTES POPULARES DE HIELO Y NIEVE



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ABSTRACT

Introduction: Following the development of ice and snow sports tourism projects, the hidden dangers of early extensive construction have gradually emerged. It mainly manifests itself in the sports safety of ice and snow sports tourism projects. **Objective:** Explore the management strategy of sports safety under the snow and ice sports tourism landscape. **Methods:** Literature research, interviews, and questionnaires were used to analyze the development in the study area of ice and snow tourism, the tourists themselves, and regional site construction. Finally, the paper analyzes strategies to improve sports safety management in related areas from the landscape manager's point of view. **Results:** The development of snow and ice sports tourism projects in the study area is satisfactory; however, due to the epidemic's impact, the current situation is relatively low, showing a trend of slow improvement. In terms of sports injury risk, after optimal training and safety management, the proportion of climatic characteristics of the site was 24.81%; the proportion of the population on the ski slopes was 40.92%; the proportion of equipment cleaning and maintenance was 59.23%; the degree of congestion on the ski slopes was 41.30%; the proportion of public safety was 34.42%; the proportion of basic emergency medical treatment was 32.30%; epidemics and other infectious diseases accounted for 83.13% of the total. Follow-up is done before the start, in the process, and after the occurrence of multiple managements. **Conclusion:** The safety management strategy of snow and ice sports tourism combines the factors of tourists and managers, and has great practical significance, so it is worthy of promotion. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Security Measures; Health Policy, Planning and Management; Snow Sports.

RESUMO

Introdução: Com o desenvolvimento de projetos de turismo esportivo no gelo e na neve, os perigos ocultos da construção extensiva precoce têm surgido gradualmente. Ele se manifesta principalmente na segurança esportiva de projetos de turismo de esportes de gelo e neve. **Objetivo:** Explorar a estratégia de gestão da segurança esportiva sob o panorama do turismo esportivo de neve e gelo. **Métodos:** Pesquisa bibliográfica, entrevistas e questionários foram usados para analisar o desenvolvimento na área de estudo do turismo de gelo e neve, e dos próprios turistas bem como a construção de locais regionais. Finalmente, do ponto de vista do gerente de paisagens, o trabalho analisa as estratégias para melhorar a gestão da segurança esportiva em áreas relacionadas. **Resultados:** O desenvolvimento de projetos de turismo esportivo de neve e gelo na área de estudo é satisfatório, porém, devido ao impacto da epidemia, a situação atual é relativamente reduzida, mostrando uma tendência de lenta melhoria. Em termos de risco de lesões esportivas, após treinamento otimizado e gerenciamento da segurança, a proporção de características climáticas do local foi de 24,81%; a proporção de população nas pistas de esqui foi de 40,92%; a proporção de limpeza e manutenção dos equipamentos foi de 59,23%; o grau de congestionamento das pistas de esqui foi de 41,30%; a proporção de segurança pública foi de 34,42%; a proporção de tratamento médico básico de emergência foi de 32,30%; epidemias e outras doenças infecciosas representaram 83,13% do total. O acompanhamento é feito antes do início, no processo, e após a ocorrência de múltiplas gestões. **Conclusão:** A estratégia de gerenciamento de segurança do turismo esportivo de neve e gelo combina os fatores de turistas e gerentes, e tem grande significado prático, por isso é digna de promoção. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores Medidas de Segurança; Políticas, Planejamento e Administração em Saúde; Esportes na Neve.

RESUMEN

Introducción: Con el desarrollo de los proyectos turísticos de deportes de hielo y nieve, han ido apareciendo gradualmente los peligros ocultos de la construcción extensiva temprana. Se manifiesta principalmente en la seguridad deportiva de los proyectos turísticos de deportes de hielo y nieve. **Objetivo:** Explorar la estrategia de gestión de la seguridad deportiva en el marco del paisaje turístico de los deportes de nieve y hielo. **Métodos:** Se utilizó la investigación bibliográfica, entrevistas y cuestionarios para analizar el desarrollo en la zona de estudio del turismo de hielo y nieve, y a los propios turistas, así como la construcción de emplazamientos regionales. Por último, desde el punto de vista del gestor del paisaje, se analizan estrategias para mejorar la gestión de la seguridad deportiva en ámbitos afines. **Resultados:** El desarrollo de proyectos de turismo deportivo de nieve y hielo en la zona de estudio es satisfactorio, sin embargo, debido al impacto de la epidemia, la situación actual es relativamente baja, mostrando



una tendencia de lenta mejora. En cuanto al riesgo de lesiones deportivas, tras optimizar la formación y la gestión de la seguridad, la proporción de características climáticas del lugar fue del 24,81%; la proporción de población en las pistas de esquí fue del 40,92%; la proporción de limpieza y mantenimiento del equipo fue del 59,23%; el grado de congestión de las pistas de esquí fue del 41,30%; la proporción de seguridad pública fue del 34,42%; la proporción de tratamiento médico básico de urgencia fue del 32,30%; las epidemias y otras enfermedades infecciosas representaron el 83,13% del total. El seguimiento se realiza antes del inicio, en el proceso y después de que se produzcan múltiples gestiones. Conclusión: La estrategia de gestión de la seguridad del turismo deportivo de nieve y hielo combina los factores de los turistas y los gestores, y tiene una gran importancia práctica, por lo que merece ser promovida.

Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.

Descriptor: Medidas de Seguridad; Políticas, Planificación y Administración en Salud; Deportes de Nieve.

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INTRODUCTION

With the holding of the Winter Olympic Games in China, winter ice and snow sports have achieved good development, and gradually shifted from minority sports to a more public level. Some cold winter regions in northern China, with the help of natural advantages, have fully developed ice and snow sports, developed them into the pillar industry of local tourism, and also derived a number of popular winter tourism routes, which have won the yearning of tourism enthusiasts.¹ Although the development of ice and snow sports tourism projects is in full swing, the sports safety problems brought by them can not be underestimated. Many ice and snow tourist attractions lack the operation of professional companies. They are often organized by local private enterprises or villagers' committees to complete the construction of sports venues by purchasing equipment and repairing venues.² What's more, in order to save costs, some developers have purchased a large number of second-hand sports equipment, so the venue itself has certain potential safety hazards.³ Many tourists who choose ice and snow tourism projects are prone to sports injuries in the process of sports due to lack of experience. These problems may cause disputes and heavy economic losses, which will seriously affect the reputation of tourist attractions and is not conducive to their subsequent development.^{4,5} Therefore, under the background of vigorously developing ice and snow sports tourism, it is very important to strengthen sports safety management.

METHOD

This paper mainly adopts three methods: literature research, interview and questionnaire survey. Firstly, through the literature research method, I consulted the relevant information, summarized the current development and existing problems of ice and snow sports tourism, so as to have a deeper understanding of the research content. Secondly, by using the interview method, I visited the sports tourism project site managers, senior ice and snow sports enthusiasts, novice ice and snow sports tourists and other people to have more understanding of the sports safety in the study area. Finally, using the method of questionnaire survey, through the combination of online and offline, the questionnaire survey is issued to explore the factors affecting the safety of ice and snow sports tourism, and put forward relevant management strategies. A total of 1325 questionnaires were collected, of which 1322 were valid. The study and all the participants were reviewed and approved by Ethics Committee of Henan University (NO.HENU19-ZD025).

RESULTS

Development of ice and snow sports tourism in the study area

In order to explore the safety management of ice and snow sports tourism in the study area, we must first analyze the current development of ice and snow sports tourism in the region. Therefore, in this section, the

ice and snow sports tourism projects in the study area are summarized and the changes in the number of ice and snow tourists in the study area from 2017 to 2021 are analyzed through the data obtained through literature research and interview.

As shown in Table 1, the ice and snow sports tourism projects in relevant regions are summarized by visiting and analyzing several snow resorts. It can be seen from the table that several ski resorts have different levels of ski runs and ski facilities according to their own terrain characteristics and investment conditions. Derivative projects mainly include three aspects, namely, entertainment sports, competition sports and related sports equipment leasing and sales. Among them, recreational sports, such as snow motorcycle, dog sledge, snow entertainment products, etc., are mainly relaxed, with low sports load and low sports intensity. Therefore, this type of sports is relatively safe. The leasing and sales of relevant sports equipment is a way for many ski resorts to increase their income, which has little impact on sports safety management.

Generally speaking, the biggest impact on the safety management of ice and snow sports is snow events and skiing teaching. Many tourists are in a state of inexperience before arriving at the snow resort. If they rashly ski, it is easy to produce a series of sports injuries. Therefore, when setting up relevant sports, it is necessary to actively patrol and strictly check, so as to recommend more suitable sports for tourists, and prevent sports injuries caused by bravado.

As can be seen from Figure 1, since 2017, the number of ice and snow tourists in the study area has shown a steady upward trend. With the construction of the site and the continuous improvement of the tourist routes, the number of tourists has increased year by year, reaching nearly 6million in 2019. However, in 2020, the number of people is less than 5million. Although it eased slightly in 2021, the number of people is still less than 6.47 million in 2017. It can be seen from the current curve analysis that the steady growth before 2019 is closely related to the improvement of site equipment, the promotion of publicity and marketing and the optimization of tourism routes. However, with the

Table 1. Summary of ice and snow sports tourism projects in the study area.

| Attraction | Basic project | Derivative |
|----------------------|---|---|
| A mountain snow farm | Alpine ski road | Snow competition, skiing teaching |
| B Mountain Snow Farm | Double board skiing, single -board skiing, junior ski road, intermediate ski lane | Snow motorcycles, dog sleds, skiing teaching, snow competitions, snow equipment sales, snow equipment leasing |
| C mountain snow farm | Primary ski latch, intermediate ski road | Snow equipment sales, snow equipment rental |
| D mountain snow farm | Double board skiing, single -board skiing, junior ski road, intermediate ski lane | Ski teaching, snow competition, snow equipment sales, snow equipment leasing, snow entertainment products |

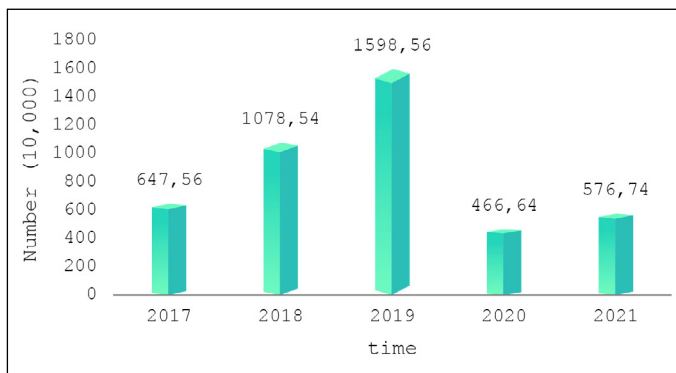


Figure 1. Changes in the number of snow and ice tourists in the study area from 2017 to 2021.

emergence of the COVID-19 in 2020, the number of tourists has been greatly reduced, mostly surrounding people, and the number of long-distance travel has decreased sharply. With the normalization of the prevention and control of the COVID-19 in 2021, the number of tourists has increased to a certain extent, but the number is still low due to the impact of various factors.

Factors affecting the safety of ice and snow sports tourism in the study area

It can be seen from the interview that the current sports safety risks of ice and snow sports tourism include two aspects: one is the tourists' own factors, and the other is related to ice and snow tourism sites. Therefore, this section analyzes these two aspects.

As shown in Figure 2, 324 people chose the option of "lack of necessary sports skills", accounting for 24.51% of the total; 655 people chose the option of "insufficient understanding of ice and snow environment", accounting for 49.55% of the total; 762 people chose the "weak safety awareness" option, accounting for 57.64% of the total; 721 people chose the option "not familiar with equipment collocation and use", accounting for 54.54% of the total; The number of people who chose the option of "having certain basic diseases" was 172, accounting for 13.01% of the total. It can be seen that most of the tourists who have sports safety accidents during tourism are novices who have never been exposed to snow skiing, or people who have a certain understanding of snow sports but overestimate their own abilities. Many novices have never been to outdoor sports venues before, so they lack a certain understanding of the local environment and are not familiar with the collocation and use of equipment. It is easy to cause sports injury if they exercise rashly. However, for some athletes who have mastered some basic skills in other areas, such as indoor environment or primary snow track, if they overestimate their own skills and are not familiar with the field, but rashly choose some advanced track for skiing, it is easy to bring a series of sports risks due to the inadaptability of the field.

In addition to the athletes themselves, the safety management of ice and snow sports tourism sites is also a major factor causing sports safety problems. In the research on the causes of equipment risks in ice and snow sports venues, as shown in Figure 3, 328 people chose the option of "site climate characteristics", accounting for 24.81% of the total; 541 people chose the "ski track quality" option, accounting for 40.92% of the total; 783 people selected the "equipment cleaning and maintenance" option, accounting for 59.23% of the total; 546 people chose the option of "ski track congestion", accounting for 41.30% of the total; The number of people who choose "public security maintenance" is 455, accounting for 34.42% of the total; The number of people who chose "basic emergency medical conditions" was 427, accounting for 32.30% of the total; 1099 people chose the option of "impact of epidemic and

other infectious diseases", accounting for 83.13% of the total. As can be seen from Figure 3, the maintenance and management of snow field equipment, the coordination of athletes, the configuration of basic medical facilities and other issues are all important factors affecting the sports safety of ice and snow sports venues. In addition, under the influence of the COVID-19, relatively densely populated areas such as ski resorts are likely to cause infection risk, so this is also the highest risk item in the current options.

Management strategies for the safety of ice and snow sports tourism in the study area

From the above analysis, it can be seen that there are many factors causing the safety of ice and snow sports tourism. For places, in addition to strengthening the maintenance and management of their own equipment, they should also reduce the sports safety risks caused by their own factors through the coordination and guidance of athletes. Therefore, this section discusses their safety management strategies.

As can be seen from Figure 4, the safety management strategy for ice and snow sports tourism mainly includes three parts. The first part is the

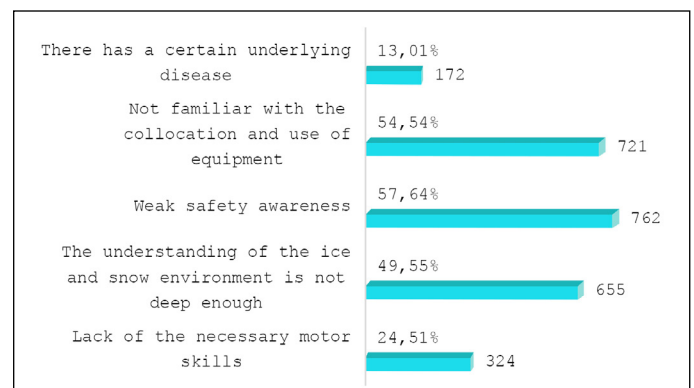


Figure 2. Causes of risks of ice and snow sports tourists.

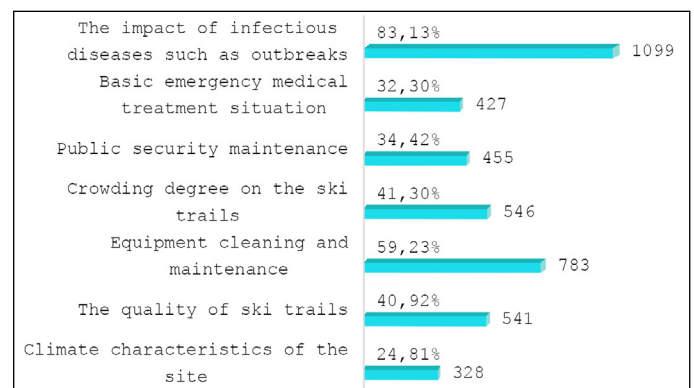


Figure 3. Causes of equipment risks in ice and snow sports venues.

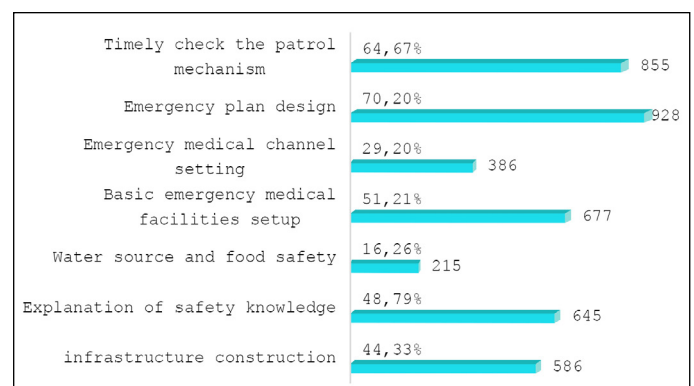


Figure 4. Analysis on safety management strategy of ice and snow sports tourism.

improvement of its own infrastructure, including regular inspection and maintenance of equipment, timely handling of problems, and attention to the management of food safety and water source safety. The second part is the guidance to the athletes, including the explanation of safety knowledge, the design of patrol mechanism and so on. The third part is to strengthen the ability to prepare for a rainy day, including setting up emergency plans, setting up basic first-aid facilities, and emergency medical channels. So as to cut off the potential safety hazards from the source, reduce the occurrence of safety problems in the process, and deal with them in time after they occur, so as to minimize the impact of sports safety problems on the life and health of tourists.

DISCUSSION

Sports safety risks are generated in the process of tourists' participation in relevant sports. Many tourists are new arrivals and are not familiar with the ice and snow environment at all. It is easy to cause sports injuries if they rashly carry out sports activities. Therefore, the management of the scenic spot should do the following: first, strengthen the publicity of safety knowledge, and promote the safety knowledge to tourists in the form of guide introduction, safety manual distribution and radio broadcast. For example, the characteristics of different snow tracks, the athletes' own safety and mental state judgment, etc. enable tourists to make a general judgment on their own physiological, psychological and sports ability before the start, so as to prevent sports safety hazards caused by their lack of awareness. Secondly, in the process of snow gear leasing, the traditional leasing method is that tourists buy relevant packages. The responsibility of managers is only to check orders, collect deposits and send and receive snow gear. If they do not judge whether tourists will use relevant snow gear, it is easy for athletes to be "arrogant". Therefore,

the snow gear rental manager should fully consult the skiers' sports experience, sports ability and psychological demands, and make certain judgments to help the skiers choose the most suitable snow gear, so as to prevent the skiers from being arrogant due to their lack of awareness of their own sports skills. Third, it is necessary to strengthen the patrol during sports. The scenic spot can recruit volunteers and public coaches, and a patrol team composed of professional skiing personnel can be formed to maintain order and investigate potential safety hazards in the snow field. In case of snow track congestion, personnel quarrel, or poor mental state of skiers, sports errors, etc., adjustments shall be made in time, such as site evacuation, sports skills guidance, timely rescue, etc., so as to eliminate potential safety hazards in the process of sports and ensure sports safety throughout the tourism process.

CONCLUSION

Through this study, we can find that although the current ice and snow sports tourism has achieved certain development, there are still many chaos, which will bring greater hidden dangers to its sports safety. Therefore, it is necessary to strengthen the safety management of sports venues, not only to strengthen the safety publicity to improve the safety awareness of tourists, but also to vigorously strengthen the construction of the snow field safety management system, so as to improve the sports safety management of ice and snow sports tourism and reduce the occurrence of sports safety accidents. So as to provide safe and comfortable tourism services for tourists, achieve the goal of win-win, and make the ice and snow sports tourism better and better.

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