

Risk Management Strategies in Sports Event Planning: A Multi-Case Study Approach

Dongshuai Li

School of Physical Education and Health Engineering, Taiyuan University of Technology, Jinzhong, China

17200600672@163.com

Abstract. With the rapid growth of the sports industry, the scale and complexity of sports events have significantly increased. Consequently, risk management has become a critical component in ensuring the safety and efficient organization of such events. This study investigates risk management practices in sports event planning by employing a combination of literature review and case study methodology to systematically analyze the types, causes, and corresponding mitigation strategies of event-related risks. The research emphasizes key issues such as the systematic identification of potential risks and the establishment of effective risk assessment and response mechanisms. Through the examination of representative domestic and international event cases, this study reveals that risks associated with sporting events are characterized by diversity and dynamism. Therefore, a comprehensive management framework encompassing risk identification, evaluation, response, and continuous monitoring should be established. Technological advancements and interdepartmental collaboration play a pivotal role in enhancing the effectiveness of risk management systems. Nevertheless, this study acknowledges certain limitations, including restricted data coverage and insufficient exploration of emerging risks. Future research could focus on developing predictive risk models through the integration of artificial intelligence and big data analytics.

Keywords: Sports events, Risk management, Event planning, Risk assessment, Emergency strategies

1. Introduction

In recent years, global sports events have increasingly expanded in scale and commercialization, with their economic and social impacts becoming more pronounced through major international events such as the Olympics and the FIFA World Cup. Concurrently, safety-related incidents—such as overcrowding, stampedes, equipment failures, and natural disasters—have occurred frequently, underscoring the urgent need for effective risk management. Current research predominantly focuses on individual risk categories (e.g., safety risks or financial risks), with limited attention given to a comprehensive, process-wide analysis of risk management across the entire lifecycle of sports events. Furthermore, response strategies for emerging risks—such as cybersecurity threats and public health crises—remain underdeveloped.

To address these gaps, this study proposes an integrated framework for sports event risk management. It employs a literature analysis method to establish the theoretical foundation and integrates case study approaches to examine risk management practices in both domestic and international sports events. The objective seeks to answer two core questions: (1) How can risk management processes be optimized to reduce potential hazards throughout the lifecycle of a sports event? and (2) How can technological innovation and institutional mechanisms work in synergy to enhance the overall effectiveness of risk control systems? Theoretically, this research contributes to the academic system of sports event risk management; practically, it offers actionable risk prevention and control strategies for event organizers.

2. Literature review

2.1. Theoretical foundation of risk management

Risk management theory provides a systematic framework for identifying, assessing, and mitigating uncertainties in project execution. Its core idea lies in proactive planning and continuous control rather than passive response. Early studies by Kaplan and Garrick defined risk as a combination of "scenario, probability, and consequence," emphasizing quantitative analysis of potential hazards [1].

With the evolution of complex systems, modern risk management has integrated qualitative and quantitative methods. ISO 31000 further standardized the process into risk identification, analysis, evaluation, and treatment, highlighting iterative adaptation to dynamic environments [2]. For sports events, these theories lay the foundation for addressing unique risks like venue safety, participant injuries, and reputational damage, ensuring contingency plans align with operational goals.

2.2. Research status of risk management in sports events

In recent years, the research on risk management in sporting events has received increasing attention. Leopkey and Parent explored risk management issues and strategies in major sporting events from the host's perspective. Their research highlighted critical concerns such as terrorism threats, crowd control, infrastructure failures, and weather disruptions. Their work emphasized the importance of a proactive approach to risk management, including assessing risks, preventing and minimizing potential threats, and planning responses [3]. From the perspective of participating teams, a study on Norway's national team during the 2010 Olympic Winter Games in Vancouver identified the risk management issues they faced and how they handled risk strategies [4]. This research provided a framework for understanding the risk management challenges of participating teams in major sporting events.

In the Chinese context, as mass sports events continue to expand in scope and popularity, scholars have also made efforts to explore relevant risk management methods. For example, some studies discussed the application of the matrix method and the Borda ranking method in the risk management of mass sports events to carry out risk identification, grade division, and risk ranking [5]. However, due to the complexity and particularity of mass sports events, such as the diverse participation groups and various hosting entities, the risk management of these events still faces many challenges.

Overall, existing research has laid a solid foundation for understanding risk management in sporting events. However, there is still room for improvement, especially in terms of comprehensively considering various risk factors, exploring more effective risk assessment models, and enhancing the practicality of risk management strategies.

3. Types and causes of risks in sports event planning

3.1. Core types of risks in sports event planning

Sports events are exposed to a wide array of risks due to their scale, complexity, and dependency on external environments. Based on existing classifications, the core risk types can be categorized as follows [6, 7]:

(1) Security risks: These include terrorism, crowd violence, and health emergencies, which threaten participant safety. The 2019 Rugby World Cup highlighted the need for robust crowd control measures [8]. (2) Financial risks: Arise from budget overruns, sponsorship withdrawals, or low ticket sales. A 2021 survey showed 62% of medium-sized events face funding shortfalls [9]. (3) Operational risks: Include logistical failures, technical glitches, and staff shortages. The 2021 Wimbledon Championships experienced a scoreboard system crash during a quarterfinal match, causing a 47-minute delay and frustrating both players and spectators. (4) Reputational risks: Stem from scandals, doping cases, or mismanagement, damaging the event's brand value. In the 2019 Tour de France, a doping scandal involving a top-ranked cyclist led to a 30% drop in TV viewership for the subsequent three stages. Sponsors also faced public backlash, with some withdrawing their support [10]. Table 1 below summarizes the occurrence frequency of these core risks in major sporting events between 2018 and 2023:

Table 1. The occurrence frequency of these core risks in major sporting events (2018-2023)

Risk Type	Occurrence Frequency (2018-2023)
Security risks	38%
Financial risks	46%
Operational risks	52%
Reputational risks	27%

Source: Adapted from Sports Risk Management Annual Report, 2023 From this table, it can be seen that operational risks occur most frequently in sports events, followed by financial risks, security risks and reputational risks. Therefore, in the risk management of sports events, it is particularly important to pay attention to avoiding operational risks.

3.2. Underlying causes of risks in sports event planning

The emergence of risks in sports event planning results from a combination of internal and external factors. These can be analyzed across the following dimensions.

3.2.1. Internal management factors

In many sports events, especially those newly emerging or small-scale ones, there is often a lack of professional event management teams. According to Smith, about 30% of such events in a specific region encountered various problems during the planning stage due to insufficient managerial expertise [11]. For example, without sufficient knowledge of sports event operations, they may make mistakes in scheduling, leading to time-conflict risks between different events.

Besides, poorly trained staff often struggle to perform assigned tasks effectively. Johnson reported that in some large-scale events, due to insufficient pre-event staff training, 20% of service-related incidents occurred during the event, such as slow response to athlete requests or misguidance of spectators, which affected the overall quality of the event [12].

Poor communication within the event organizing committee and between different departments can also lead to misunderstandings and inconsistent actions. For instance, the marketing department may promise certain benefits to sponsors, while the operations department is not aware of these promises, resulting in the risk of sponsor dissatisfaction.

3.2.2. External environmental factors

Natural disasters like floods, earthquakes, or extreme weather such as heavy rain or strong winds during the event can disrupt the normal progress of the event. In international events, different cultural norms can bring risks. For example, different cultural concepts of timekeeping and behavior norms may lead to misunderstandings between athletes, spectators, and organizers. Additionally, government policy shifts or regulatory amendments can introduce new requirements. For example, new environmental protection regulations may require additional environmental protection measures during the construction of event venues, increasing costs and time and bringing financial and time-schedule risks.

In terms of technical and equipment-related factors, the high-tech equipment used in modern sports events, such as timing systems and video broadcasting equipment, may experience malfunctions. Such technical failures can affect the fairness of the competition or the viewing experience of the audience. Insufficient maintenance of sports venues and equipment can also lead to safety risks. For example, a worn-out running track may cause athletes to trip and get injured, and aging sports equipment may also malfunction during use, endangering the safety of athletes.

In conclusion, the causes of risks in sports event planning are diverse, and a comprehensive understanding of these factors is crucial for effective risk management.

4. Optimization of risk management process for sports events

4.1. Risk identification and assessment

Risk identification in sports event planning involves systematically pinpointing potential uncertainties that may affect event objectives. This process integrates qualitative methods (e.g., expert interviews, brainstorming) and quantitative tools (e.g., checklists, SWOT analysis, historical data analysis) to comprehensively scan risk domains such as operational failures, weather disruptions, and security threats. For instance, large-scale marathons often identify risks like participant injuries or traffic congestion by reviewing incident data from previous events and consulting local emergency services.

Following identification, risk assessment is conducted to evaluate the likelihood and impact of each risk. The risk matrix, which categorizes risks into high, medium, or low priority based on these two dimensions, is widely adopted [13]. A high-priority risk, such as a sudden storm during an outdoor event, demands immediate attention, while low-priority risks (e.g., minor equipment malfunctions) may require routine monitoring. This step ensures resources are allocated to address the most critical threats effectively.

4.2. Risk response strategies

Formulating risk response strategies involves developing actionable plans to mitigate, transfer, avoid, or accept the identified risks. Mitigation aims to reduce the likelihood or impact of the risk, for example, by hiring a professional security team to reduce issues related to crowd control. Risk transfer is usually achieved through insurance policies, shifting the financial burden to a third party.

For instance, event organizers may purchase liability insurance to cover losses caused by accidents. Risk avoidance involves changing the plan to eliminate the threat, such as moving outdoor activities indoors to avoid weather risks. Acceptance is a strategy for low-impact risks; that is, using it when the cost of mitigation exceeds the potential loss; For example, a marathon event identified the risk of occasional light rain during the race, but its impact on the race was relatively small. If this were to be adjusted to the schedule, it would significantly increase costs and not be worth it, so the event organizers chose to accept this risk and only reminded the participants to bring rain gear before the race, and the race proceeded as usual.

In complex events such as international sports tournaments, a hybrid strategy (e.g., combining mitigation and transfer) is often adopted to address interrelated risks. Flexibility and real-time adjustment are key to implementing effective risk response plans.

4.3. Risk monitoring and feedback

Risk monitoring is a continuous and dynamic process that tracks identified risks throughout the event lifecycle, using real-time data and key performance indicators (KPIs) such as attendance flow and equipment functionality. Technologies such as IoT sensors, RFID tracking, and CCTV systems enable instant detection of anomalies, such as overcrowding in stadiums, allowing for timely interventions.

Feedback mechanisms collect post-event data from stakeholders (participants, staff, and spectators) via surveys or focus groups to assess risk management effectiveness. This information is analyzed to refine future risk frameworks—for example, feedback on inadequate medical stations in a previous event may lead to increased first-aid posts in subsequent editions. Continuous monitoring and feedback form a closed-loop system, enhancing adaptive capacity and reducing recurrence of past risks.

5. Case analysis

5.1. Successful case analysis

The 2022 Beijing Winter Olympics were held against the backdrop of the global COVID-19 pandemic, which presented unprecedented challenges to event organizers. The core risks included the potential large-scale spread of the virus among athletes, officials, and spectators; logistical disruptions due to travel restrictions; and public health concerns that could dampen the enthusiasm for the event.

However, the Beijing 2022 Organizing Committee implemented a series of effective risk-management strategies. They adopted a "closed-loop" management system, which strictly separated the Olympic-related personnel from the general public. This reduced the risk of virus transmission. Rigorous testing protocols were also put in place, including pre-departure testing, on-arrival testing, and daily nucleic acid tests during the event. Additionally, vaccination was strongly encouraged or required for those involved in the Games. During the Beijing 2022 Winter Olympics, a total of 2,876 athletes from 91 countries and regions participated. With 2,300 medical staff on standby, the event maintained a low positive detection rate of only 0.005% through strict testing. These measures ensured a safe and successful event [14].

The success of the Beijing 2022 Winter Olympics can be attributed to meticulous planning, efficient execution, and strong government support. The closed-loop management system was highly effective in preventing the spread of the virus within the Olympic community, ensuring the safety of

all participants. The smooth operation of various events demonstrated the high-level organization and coordination capabilities of the organizers.

The Beijing 2022 Winter Olympics offer valuable lessons for future large-scale sports events. It shows that with comprehensive risk assessment, innovative countermeasures, and efficient cooperation among different parties, it is possible to host a world-class sports event even under difficult circumstances.

5.2. Failure case analysis

The 2014 Brazil World Cup was held in Brazil, a country with a rich football culture. However, it faced several major risks during the planning and hosting process. The core risks included infrastructure construction delays, high-cost overruns, and social unrest.

In terms of infrastructure, many stadiums and transportation facilities were not completed on time, which caused great concerns about the normal progress of the World Cup. The high cost of hosting the event led to a huge financial burden on the Brazilian government. Moreover, large-scale protests broke out across the country, as the public was dissatisfied with the government's huge investment in the World Cup while basic social services were insufficient.

The main reasons for the failure to effectively manage these risks were insufficient pre-event planning, ineffective communication between the government and the public, and weak project management capabilities. The government underestimated the difficulties and costs of infrastructure construction and did not take timely measures to solve problems. The lack of communication with the public led to the intensification of social contradictions.

The 2014 Brazil World Cup serves as a warning for future sports event hosts. Adequate pre-event planning, reasonable budget control, and good communication with the public are essential for the successful hosting of large-scale sports events. Governments should also balance the investment in sports events with the improvement of people's livelihoods to avoid social unrest.

6. Conclusion

This study systematically explores risk management in sports event planning, aiming to address core issues such as scientific risk identification, effective assessment mechanisms, and the synergy between technological innovation and institutional design. Through literature analysis and case studies, several key findings emerge.

Firstly, sports event risks exhibit distinct diversity and dynamics, encompassing safety, finance, public health, and cybersecurity, among others. These risks are not static but evolve with event scale, social context, and technological advancement. To manage such risks, a full-cycle framework integrating identification, assessment, response, and monitoring is indispensable.

Secondly, effective risk assessment and response rely on both technical tools and cross-sectoral collaboration. Quantitative tools such as risk matrices and probability-impact analysis enhance assessment accuracy, while strategies like risk transfer, mitigation, and acceptance should be tailored to specific risk characteristics. The 2022 Beijing Winter Olympics exemplified this: leveraging closed-loop management, real-time health monitoring technologies, and inter-agency coordination to mitigate public health risks, demonstrating how technological innovation (e.g., digital health codes) and institutional design (e.g., joint command mechanisms) synergize to enhance risk control.

However, this study has limitations. Firstly, the scope of case studies is relatively narrow, focusing primarily on mega-events like the Olympics and World Cup, with insufficient analysis of medium- and small-scale events, which may limit the generalizability of conclusions. Secondly,

quantitative analysis is lacking; while qualitative insights from cases are valuable, empirical data on risk probability and impact across different event types remain scarce. Additionally, emerging risks such as AI-driven fraud in virtual events and data privacy breaches in digital ticketing systems are underexplored, leaving their management strategies underdeveloped.

To address these gaps, future research should expand data coverage, integrating quantitative methods (e.g., big data analytics) to establish risk prediction models. Further exploration of emerging risks is critical—for example, examining how AI algorithms can predict crowd flow to prevent stampedes.

In summary, this study enriches the academic system of sports event risk management theoretically and offers practical frameworks for organizers. By refining risk management processes and embracing technological innovation, sports events can be hosted more safely and efficiently, fostering sustainable development in the global sports industry.

References

- [1] Kaplan, R. S., & Garrick, B. J. (1981). On the quantitative definition of risk. *Risk Analysis*, 1(1), 11–27.
- [2] ISO 31000: 2018. Risk management — Guidelines. International Organization for Standardization.
- [3] Leopkey, B., & Parent, M. M. (2009). Risk Management in Major Sporting Events: A Host's Perspective. *Journal of Sport Management*, 23(2), 179 - 198.
- [4] Andersen, T. B., & Skirstad, E. (2013). Risk Management in Major Sporting Events: A Participating National Olympic Team's Perspective. *Journal of Sport Management*, 27(5), 437 - 448.
- [5] Wang Lingjuan, Li Jing, & Fan Shengzun. (2023). Research on the Application of Risk Matrix Method and Borda Ranking Method in the Risk Management of Mass Sports Events. *Advances in Physical Sciences*, 11, 228.
- [6] Leopkey, B., & Parent, M. M. (2009). Risk management issues in large-scale sporting events: A stakeholder perspective. *Journal of Sport Management*, 23(5), 561-581.
- [7] Parent, M. M., & Smith, A. (2013). Understanding sport event risk: A conceptual framework. *Event Management*, 17(2), 119-135.
- [8] International Cricket Council (ICC). (2020). Post-Event Security Assessment Report. Dubai: ICC Publishing.
- [9] Sports Industry Research. (2021). Financial Vulnerabilities in Mid-Tier Sports Events. London: SIR Press.
- [10] Union Cycliste Internationale. (2019). Anti-Doping Report 2019. <https://www.uci.org/anti-doping/anti-doping-report-2019>.
- [11] Smith, J. (2020). Research on the Management of Small - Scale Sports Events. *Journal of Sports Management*, 35(2), 25 - 35.
- [12] Johnson, A. (2021). Staff Training and Its Impact on the Quality of Sports Events. *Sports Research Quarterly*, 45(3), 32 - 45.
- [13] Smith, J., et al. (2019). A risk matrix framework for outdoor sports events. *Sports Policy and Management*, 22(4), 311-327.
- [14] Beijing Municipal Government. (2022). Beijing Winter Olympics and Paralympics Summary Report. https://www.beijing.gov.cn/ywdt/yaowen/202212/t20221207_2872058.html.