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Safety, Risk and Regulation in Adventure Tourism: A Systematic Literature Review

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ABSTRACT

Risk distinguishes adventure tourism from other tourism, yet the safety of adventure tourists and the regulation of operators remain unevenly studied. Following the PRISMA 2020 guidelines, this paper systematically reviews research on safety, risk and regulation in adventure tourism. A Scopus search on 22 February 2026 identified 792 records; 447 journal articles were screened, and 74 studies published between 1997 and 2026 were included. They were analysed through keyword co-occurrence mapping and thematic synthesis. Five themes emerged: accidents and injuries; risk management by operators, guides and industries; tourists' risk perception and safety behaviour; risk as part of the adventure product; and regulation, governance, rescue and crisis response. The field has shifted from injury epidemiology, concentrated in New Zealand, towards tourists' risk perception and, more recently, guides' competencies and industry-wide risk management. Its share of adventure tourism research has fallen from a quarter before 2010 to one-eighth since 2020. Authors from the United Kingdom, Australia and New Zealand dominate; studies from India and other emerging destinations are few, injury data have scarcely been collected since 2013,

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and the effectiveness of regulation is largely unexamined. A research agenda and implications for operators, destination managers and regulators are proposed.

1. Introduction

Adventure tourism is commonly defined by its combination of physical activity, interaction with nature and an element of risk or challenge (Buckley, 2006). Risk lies at the heart of the product: it is part of what tourists seek and pay for, and it is what operators must control if their clients are to return home safely. Commercial adventure tourism therefore embodies a paradox, in which a planned and controlled version of an activity usually defined as dangerous and unpredictable must be delivered as an exciting experience (Fletcher, 2010).

As adventure tourism has grown from a niche into a mass market, the consequences of failing to manage this paradox have become more visible. Accidents at adventure sites harm tourists and workers, damage the reputation of destinations and can undermine an entire sector (Hansen et al., 2019b). Governments have responded with registration schemes, safety standards and, occasionally, bans. In India, for example, Kerala introduced safety regulations for adventure activities in 2019 and made the registration of adventure operators mandatory in 2021 (Deccan Chronicle, 2021), while the National Strategy for Adventure Tourism identifies a safety framework among its pillars (Ministry of Tourism, 2022).

Research on these questions has accumulated over three decades, but it is scattered across disciplines, including tourism management, safety science, psychology, geography and law. Earlier reviews of adventure tourism have mapped the field as a whole (Cheng et al., 2018; Rantala et al., 2018) without examining safety, risk and regulation in depth. This paper fills that gap. Its objectives are:

1. To describe the volume, sources, geography and methods of research on safety, risk and regulation in adventure tourism;
2. To identify and synthesize the main themes in this research; and
3. To identify gaps in the research and propose an agenda for future studies and implications for practice.

2. Methodology

The review followed the PRISMA 2020 statement for reporting systematic reviews (Page et al., 2021).

2.1 Search Strategy

Scopus was chosen as the database because of its broad coverage of peer-reviewed journals in tourism, management and the social sciences. The search was conducted on 22 February 2026 with the term “adventure tourism” in titles, abstracts and keywords. The results were limited to journal articles in English in the subject areas of Business, Management and Accounting; Social Sciences; Environmental Science; Economics, Econometrics and Finance; Psychology; and Multidisciplinary. The full search query was:

TITLE-ABS-KEY ("adventure tourism") AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ENVI") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "PSYC") OR LIMIT-TO (SUBJAREA , "MULT")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))

The search returned 792 records, of which 447 journal articles remained after the filters were applied.

2.2 Eligibility Criteria

Studies were included if safety, risk (actual or perceived), accidents and injuries, risk management, rescue, or the regulation and governance of adventure activities was a central focus of the study, as shown by its title, objectives or main findings. Studies in which risk or safety was mentioned only in passing, for example as one of many motives or as background, were excluded.

2.3 Screening

The 447 records were first screened by searching their titles, keywords and abstracts for terms related to safety and risk (safety, risk, accident, injury, fatality, hazard, danger, incident, emergency, rescue, regulation, legislation, liability, insurance and death). This identified 159 records. The abstract of each of these was then read in full and assessed against the eligibility criteria. Eighty-five records were excluded because safety, risk or regulation was not a central focus, leaving 74 studies for the review (Figure 1).

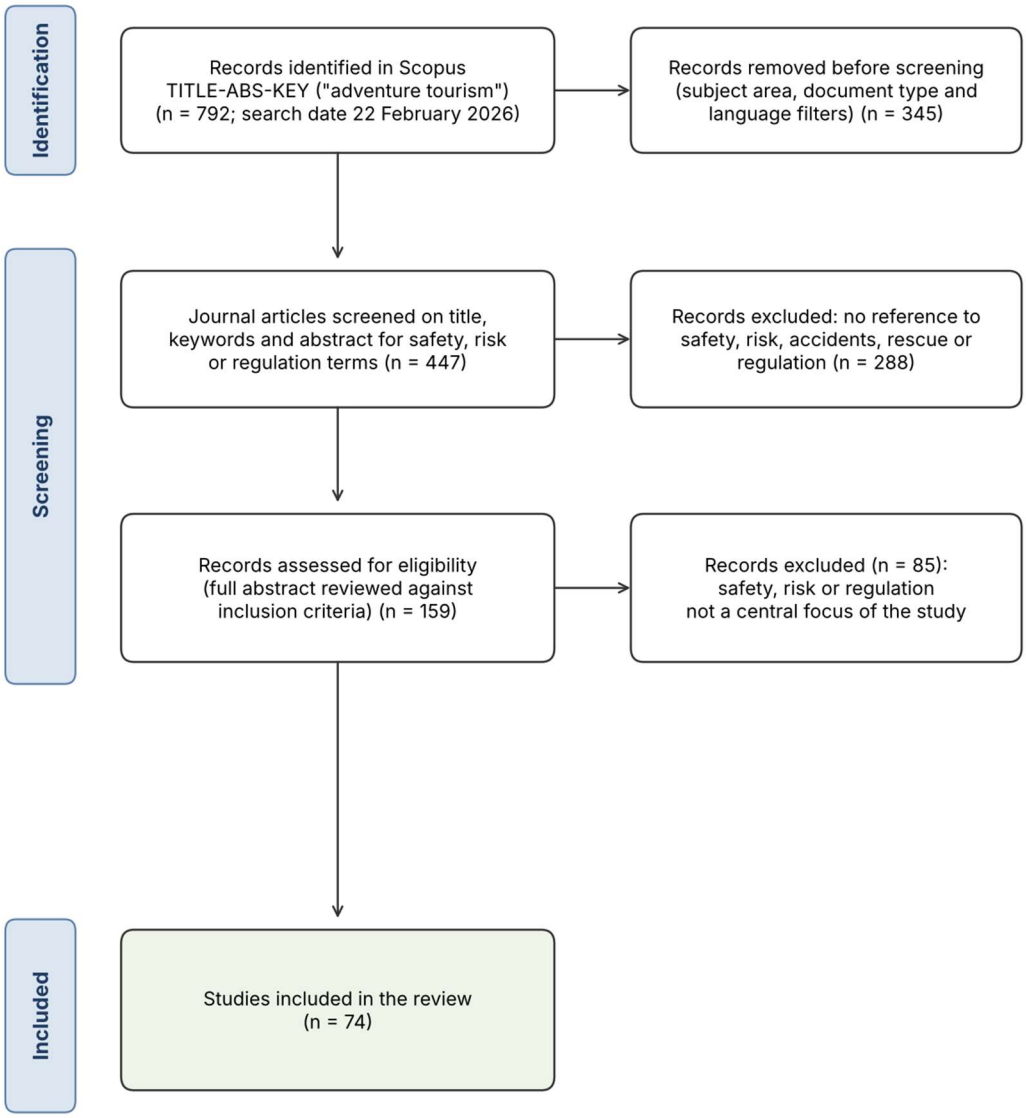

Figure 1. PRISMA flow diagram of the selection of studies.

2.4 Analysis

For each study, the year, journal, country of the first author's affiliation, number of citations and method were recorded from the Scopus export. The studies were then coded inductively into themes on the basis of their focus and findings, following the approach of thematic synthesis. Each study was assigned to one main theme. The coded studies are listed in the Appendix.

2.5 Bibliometric Analysis

Two bibliometric analyses were added to the thematic synthesis. First, the number of included studies was compared with the number of adventure tourism articles in the full dataset of 447 in each period, to show how the attention given to safety, risk and regulation has changed. Second, a keyword co-occurrence network was built from the author keywords and Scopus index keywords of the 74 included studies. Synonyms were merged (for example, "risks" and "risk", "risk perception" and "perceived risk"), the search term "adventure tourism" and general terms such as "tourism" were removed, and keywords occurring in at least three studies were retained. Two keywords were linked when they occurred in the same study, and clusters were identified with the Louvain community detection algorithm. The analysis was carried out in Python with the networkx library.

3. Bibliometric Overview

3.1 Growth of the Literature and Its Place in the Field

The 74 studies span three decades, from 1997 to 2026. Twenty were published up to 2009, 27 between 2010 and 2019, and 27 in the six years from 2020 to February 2026. Output reached its highest annual level in 2025, with nine studies.

Table 1 *Studies on Safety, Risk and Regulation as a Share of Adventure Tourism Research*

Period	Adventure tourism articles (Scopus dataset)	Studies included in this review	Share
1990–2009	78	20	25.6%
2010–2019	154	27	17.5%
2020–2026	215	27	12.6%
Total	447	74	16.6%

Note. The full dataset comprises the 447 English-language journal articles retrieved by the search (Section 2.1).

The growth in the number of studies hides a relative decline (Table 1). Before 2010, one in four adventure tourism articles focused on safety, risk or regulation; since 2020, only one in eight has done so. Adventure

tourism research has expanded rapidly into other topics, such as motivation, experience, satisfaction and sustainability, while research on safety has grown much more slowly.

3.2 Sources, Geography and Methods

Table 2 *Profile of the Studies Reviewed (n = 74)*

Characteristic	Category	Number
Period	1997–2009	20
	2010–2019	27
	2020–2026	27
Leading journals	Journal of Outdoor Recreation and Tourism	10
	Tourism Management	10
	Annals of Tourism Research	5
	Tourism Recreation Research	5
	Tourism Review; Journal of Sport and Tourism	3 each
Country of first author	United Kingdom	13
	Australia	12
	New Zealand	8
	United States	6
	China	4
	India	3
	Others (23 countries)	28

Characteristic	Category	Number
Method	Qualitative	27
	Quantitative (survey or secondary data)	26
	Conceptual or legal analysis	10
	Mixed methods	6
	Experimental	3
	Not stated in abstract	2

Note. Country is based on the affiliation of the first author.

The studies were published in a wide range of journals, led by the *Journal of Outdoor Recreation and Tourism* and *Tourism Management* (Table 2). Authors from the United Kingdom, Australia and New Zealand wrote 33 of the 74 studies, and those from the United States, China and India a further 13. Qualitative and quantitative designs were almost equally common, while experiments were rare.

3.3 Most Influential Studies

Table 3 *Most Cited Studies*

Study	Journal	Theme	Citations
Cater, 2006	Tourism Management	Risk as product	329
Buckley, 2012	Tourism Management	Risk as product	295
Wang et al., 2019	Tourism Management	Tourists' risk perception	155
Walle, 1997	Annals of Tourism Research	Risk as product	123
Erfurt-Cooper, 2011	Geoheritage	Regulation and governance	100
Bentley & Page, 2008	Tourism Management	Accidents and injuries	94
Duffy & Moore, 2011	Journal of Sustainable Tourism	Regulation and governance	83
Bentley & Page, 2001	Annals of Tourism Research	Accidents and injuries	79
Williams & Soutar,	Asia Pacific Journal of	Risk management	75

Study	Journal	Theme	Citations
2005	Tourism Research		
Bentley et al., 2001b	Applied Ergonomics	Accidents and injuries	70

Note. Citations as recorded in Scopus on 22 February 2026.

The most cited studies concern the nature of risk in the adventure product: whether tourists seek actual risk or the sensation of it (Table 3). The 74 studies had been cited 2,572 times in all, with a median of 19 citations per study.

3.4 Keyword Co-occurrence

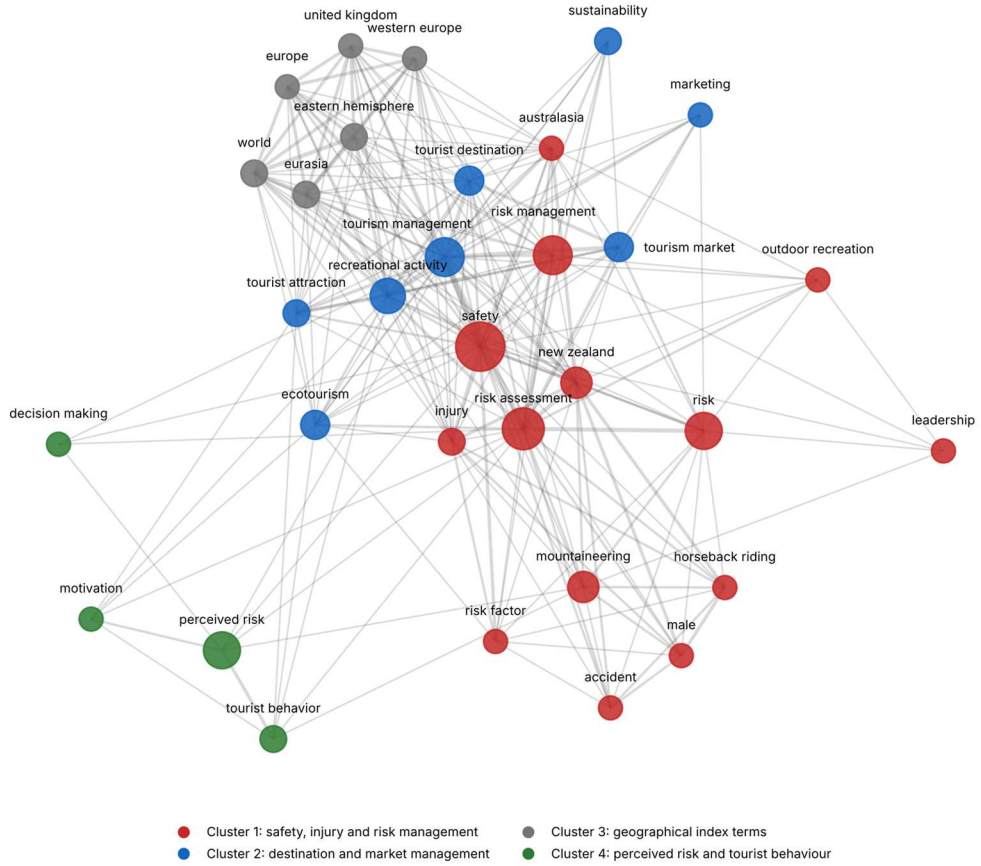

Figure 2. Keyword co-occurrence network of the included studies (keywords occurring in at least three studies; node size shows frequency).

Thirty-two keywords occurred in at least three studies, and they formed four clusters (Figure 2). The largest cluster, centred on *safety*, *risk assessment* and *risk management*, links these terms with *injury*, *accident*, *risk factor*, *mountaineering*, *horseback riding* and *New Zealand*, reflecting the injury research of the early 2000s

and later work on operators and guides. A second cluster joins *tourism management*, *recreational activity*, *tourist destination*, *tourism market*, *ecotourism*, *sustainability* and *marketing*, and represents studies that treat safety as a matter of destination management. A third, small cluster connects *perceived risk*, *tourist behavior*, *motivation* and *decision making*, the terms of the recent research on tourists' risk perception; it lies at the edge of the network with few links to the safety cluster. The fourth cluster consists of geographical terms added by Scopus indexing (*Europe*, *United Kingdom*, *Eurasia*). The map therefore shows two largely separate conversations: one about safety and risk management, and another about how tourists perceive risk.

4. Thematic Synthesis

Table 4 *Themes by Period of Publication*

Theme	1997–2009	2010–2019	2020–2026	Total
T1. Accidents and injuries	8	2	0	10
T2. Risk management by operators, guides and industry	2	10	7	19
T3. Tourists' risk perception and safety behaviour	4	5	13	22
T4. Risk as part of the adventure product	3	6	4	13
T5. Regulation, governance, rescue and crisis	3	4	3	10
Total	20	27	27	74

The five themes, and the way their prominence has changed over time, are shown in Table 4.

4.1 Theme 1: Accidents and Injuries

The first body of research sought to measure how safe adventure tourism actually is. Almost all of it comes from a single programme of research in New Zealand, conducted between 1996 and 2006 (Bentley & Page, 2008). Using hospital discharge records, mortality data and accident compensation claims, these studies found that adventure and recreational activities accounted for about one in five injuries among overseas

visitors and 22% of their fatalities (Bentley et al., 2001b; Bentley et al., 2001c), and that the most injuries arose from independent, unguided activities such as mountaineering, skiing and tramping, rather than commercial tours (Bentley et al., 2007; Bentley et al., 2001c). Among commercial activities, horse riding and cycling were the most frequent sources of client injury, falls were the most common mechanism, and the most severe injuries, as indicated by claim costs, arose in air activities and jet boating (Bentley et al., 2007).

A recurring finding was that official and operator data understate the problem. Operators reported very low injury rates, suggesting serious under-reporting, especially among smaller operators and in the least regulated sectors (Bentley et al., 2001a). Comparable surveys in Scotland (Page et al., 2005a; Page et al., 2005b) and Queensland (Bentley et al., 2010) found low reported incident rates, with slips, trips and falls most common and adverse weather and client behaviour the main risk factors, but also that a notable share of operators did not apply important safety management practices (Bentley et al., 2010). Outside adventure activities in the narrow sense, crash data on tourists riding rental mopeds showed how licensing rules can expose inexperienced visitors to risk (Blackman & Haworth, 2013).

The striking feature of this theme is its decline. Eight of the ten studies were published before 2010, and none since 2013. Injury surveillance, which these studies called for as the basis of risk management (Bentley & Page, 2001; Bentley & Page, 2008), does not appear to have been carried forward in the peer-reviewed literature, and none of the studies comes from Asia, Africa or Latin America.

4.2 Theme 2: Risk Management by Operators, Guides and Industry

The largest group of recent studies examines how risk is managed in practice. A first strand focuses on **guides**, who are both producers of risk and protectors against it (Jackson, 2019). Studies have identified the competencies guides need to keep tourists safe in demanding environments: technical, interpersonal and operational skills combined with situated knowledge of local conditions in the Arctic (Hild et al., 2023); and non-technical skills such as situation awareness, decision-making, leadership and communication among mountain guides (Irwin et al., 2023). Guides' safety motivation is shaped by their teams, through social identity and trust (Jackson, 2019), and guides adapt their routines to uncertainty in avalanche terrain (Løland & Hallgren, 2025) and choose terrain to balance client experience against hazard (Hendrikx et al., 2015). Good communication between staff and clients is critical in rescuing clients from danger, while poor communication puts them at unnecessary risk (Buckley, 2010). Tourists themselves value guides chiefly for the safety they provide (Rebelo et al., 2018).

A second strand concerns **operators and the market**. Competitive pressures push some operators to "cut corners" to remain viable (Williams & Soutar, 2005), and instructors in the United Kingdom reported doing so as the industry's popularity raised the pressure for profit (Clinch & Filimonau, 2017). Models and tools have been proposed to support operators, including an injury-control model (Bentley et al., 2010), a Haddon matrix for identifying and mitigating risks (Piramanayagam & Seal, 2017), and a model linking clients' perceptions of hazard and control to industry standardisation (Morgan, 2000). A recreation safety climate at a site strengthens the link between divers' involvement and their experience (Cheng et al., 2024).

A third strand, which has grown since 2019, addresses **industry-wide risk management**. A series of studies of the largely self-regulated aerial adventure industry in the United States argues that, because one serious accident affects all operators, the industry needs collaborative, industry-wide risk management involving public and private stakeholders (Hansen et al., 2019b; Hansen et al., 2019c), possibly in the form of enterprise risk management (Hansen et al., 2022), and examines how innovation can both support and complicate operational risk management (Hansen et al., 2019a). Other studies extend the analysis to the distribution of risk among stakeholders on Everest (Schweinsberg & Hall, 2024), to nature-based responses to extreme weather (Jirásek & Hanuš, 2022) and to the safety expectations created by China's distinctive model of mass river rafting (Buckley et al., 2014).

4.3 Theme 3: Tourists' Risk Perception and Safety Behaviour

This is the largest and fastest-growing theme, with 13 of its 22 studies published since 2020. Most are quantitative studies that model perceived risk as a determinant, mediator or moderator of tourists' intentions. Their findings show that the effect of risk is not simply negative. Perceived risk had an inverted-U effect on the travel intention of potential adventure tourists, first increasing and then reducing it, with desired risk as a moderator (Teng et al., 2025). In India, perceived risk positively moderated some of the effects of involvement, attitude and destination image on intention to visit and to spread word of mouth (Soundararajan et al., 2023). Risk perception also moderated the links between motivation, attitude and involvement among young Vietnamese travellers (Luong & Nguyen, 2024); sensation seeking and worry moderated participation intentions (Kiatkawsin et al., 2021); and personality traits interacted with risk preference in the choice of hard or soft adventure (Xu et al., 2025). Generational differences matter: younger consumers embraced risk while older ones prioritised thrill (Duverger, 2025). Several dimensions of perceived risk, from equipment to financial risk, affected the environmental image and revisit intention of cave divers (Zaid et al., 2023), and perceived risk was examined together with benefit, trust and satisfaction among paragliding participants (Akbulut et al., 2024). Belief in luck and perceived risk shaped intentions to

undertake wingsuit flying (Ali et al., 2025); crowd and social risks were related to windsurfers' motives (Prayag & Jankee, 2009); rafters' perceived risk and competence shaped their feelings of fear and control (Morgan, 2001); and safety concerns, along with social media, shaped young Vietnamese travellers' preference for organised tours (Luong, 2025).

A smaller set of studies examines **safety behaviour**. Visitors at tidal-bore sites in China fell into groups with different risk perception attitudes and safety behaviours, with worry playing a mediating role (Wang et al., 2019). On-site information and hikers' motives shaped precautionary behaviour (Scholl-Grissemann et al., 2022), while user-generated content on an online platform revealed that more than a third of published ski tours were relatively dangerous on the day they were made (Plank, 2016). Tourists' satisfaction depended on their perception that the destination itself provides protective facilities and management, not only on their own self-protection (Li et al., 2026). After COVID-19, adventurousness reduced travel anxiety and affected self-protective behaviour (Selem et al., 2024).

Other studies examine how risk is perceived in specific settings and segments: trekkers' fear when risk was experienced directly in the Everest region (Mu & Nepal, 2016), segment differences between domestic and international climbers on Mount Fuji (Jones & Yamamoto, 2015), the effect of media coverage of accidents, which increased perceived risk but also intention to participate among young people (King & Beeton, 2006), the negative effect of fear-evoking advertising photographs on intention to visit (Hem et al., 2003), and the role of risk in the loyalty of adventure tourists in Tanzania (Mlozi, 2014).

4.4 Theme 4: Risk as Part of the Adventure Product

A conceptually important group of studies, which includes the most cited works in the review, asks what role risk actually plays in the adventure experience. Early work distinguished adventure undertaken to confront risk from adventure pursued for insight or knowledge (Walle, 1997). Studies of commercial adventure in New Zealand found that participants primarily seek fear and thrill rather than actual risk, and that the most successful operators reduce actual risk while commodifying the thrill (Cater, 2006). Similarly, skilled adventurers are motivated by "rush", the simultaneous experience of flow and thrill, rather than by risk itself (Buckley, 2012), and many scuba divers seek tranquillity more than the thrill of risk (Fuchs et al., 2016).

Other studies explain how operators reconcile safety and risk. A "public secret" allows rafting tourists to believe simultaneously that they are safe and at risk (Fletcher, 2010); tourism boards represent adventure as both comfortable and thrilling (Imboden, 2012); websites construct risk as both negative and positive (Ädel

& Östman, 2025); and a "protective frame", built by guides, equipment and safety management, allows tourists to enjoy risk as excitement (Houge Mackenzie & Kerr, 2012; Zhu & Xu, 2022). Risk and fear are used deliberately in marketing to young travellers (Schlegelmilch & Ollenburg, 2013). Critical studies remind us that risk is unequally distributed: in Himalayan mountaineering, local guides bear risks that are by-products of Western clients' pursuit of adventure (Bott, 2009; Miller & Mair, 2020), and mortality itself becomes a source of meaning for mountaineers (Bates et al., 2025).

4.5 Theme 5: Regulation, Governance, Rescue and Crisis

Regulation is the least developed theme. Only one study analyses a national legal framework for adventure tourism directly: Jordan's 2019 instructions for organising adventure trips, which provide safety guidelines, insurance and age rules but neglect marine and air activities and accessibility (Alramamneh et al., 2025). Other studies examine the governance of particular activities: global standards for elephant welfare and their uneven application (Duffy & Moore, 2011); the consequences of banning mountaineering in India's Nanda Devi Biosphere Reserve, which improved forest cover and wildlife but caused loss of income and out-migration (Silori, 2004); the legal issues of authorisation, liability and certification in space tourism (von der Dunk, 2011) and the definition of acceptable risk in that industry (Spector, 2020); and the risk management of tourism in active volcanic environments (Erfurt-Cooper, 2011). The ambiguous identity of aerial adventure parks, as adventure activity or amusement ride, was found to contribute to poor inspection and policy (Hansen et al., 2020).

Two studies concern what happens when things go wrong. Volunteer desert rescuers in Israel were motivated partly by their own leisure interests and tended to blame rescued hikers for their predicament (Uriely et al., 2002), and adventure tour operators' handling of the press during crises shaped public perception of their reputations (Stanbury et al., 2005). A general study discussed natural, social and epidemiological dangers to tourists (Irina Gennadiyevna et al., 2014).

5. Discussion

5.1 How the Field Has Evolved

The review shows a clear shift in focus. In its first decade, research on adventure tourism safety was largely epidemiological: it asked how many tourists were injured, in which activities and why. In the 2010s attention moved to operators, guides and the commodification of risk. Since 2020 the field has been dominated by quantitative models of tourists' risk perception and intentions, many of them from Asia, together with a renewed interest in guides' competencies and industry-wide risk management. This shift has

enriched our understanding of how tourists think about risk, but it has left the measurement of actual harm behind. The keyword map confirms the separation: research on tourists' perceived risk is only weakly connected to research on safety management and injuries, although the two concern the same problem from different sides. At the same time, safety and risk have become a smaller part of adventure tourism research as a whole (Table 1), even as the industry has grown.

5.2 Gaps in the Research

Little current evidence on actual harm. No study of injury incidence has been published in the reviewed literature since 2013, and almost all such evidence comes from New Zealand, Scotland and Queensland. As adventure tourism has spread to new destinations and new activities, such as aerial adventure parks, ziplines and glass bridges, systematic data on accidents and injuries have not followed.

Narrow geography. Authors from the United Kingdom, Australia and New Zealand wrote nearly half of the studies. Only three studies have first authors from India (Piramanayagam & Seal, 2017; Soundararajan et al., 2023; Silori, 2004), none concerns the Indian states that are now actively developing adventure tourism, and few concern Africa or Latin America. Yet these are the destinations where regulation is newest and enforcement weakest.

Regulation is under-studied. Although many studies end with recommendations for policy, very few examine regulation itself. There is almost no evidence on how registration schemes, safety standards or inspections are designed and enforced, how operators comply with them, or whether they reduce accidents. The single national study (Alramamneh et al., 2025) is descriptive.

The perspectives are rarely joined. Studies examine either tourists, or guides, or operators, or regulators. Few combine them, although safety depends on all of them together, as the dual responsibility of tourists and destinations for safety shows (Li et al., 2026).

Unregulated provision is invisible. Several studies note that accidents concentrate in the least regulated sectors (Bentley et al., 2001a) and that market pressure leads to corner-cutting (Williams & Soutar, 2005; Clinch & Filimonau, 2017), but no study examines unregistered or informal adventure providers directly.

5.3 Research Agenda

Table 5 *Agenda for Future Research*

Gap	Research questions
Current data on harm	What is the incidence of injuries and fatalities in adventure tourism today, by activity and destination? How can operator reporting and public data be combined in a surveillance system?
Emerging destinations	How do safety, risk management and regulation work in India, South and South-East Asia, Africa and Latin America?
Effectiveness of regulation	How are registration schemes and safety standards designed, enforced and complied with? Do they reduce accidents? What explains non-compliance?
Unregistered providers	Who are the unregistered providers, why do they remain outside regulation, and how do they affect safety and competition?
Joined-up perspectives	How do tourists, guides, operators and regulators share responsibility for safety at the same destination?
New activities	What are the risks of new attractions such as aerial parks, glass bridges and sky dining, and how should they be regulated?
Communication	How does information on safety and registration influence tourists' choice of operator and their own behaviour?

6. Implications for Practice

For operators and guides. The evidence that tourists seek thrill rather than actual risk (Cater, 2006; Buckley, 2012) means that safety need not reduce the appeal of the product; well-managed operators can offer intense experiences with low actual risk. Investment in guides' technical and non-technical skills, team safety culture and communication is supported by several studies (Jackson, 2019; Irwin et al., 2023; Hild et al., 2023; Buckley, 2010).

For destination managers. Tourists' satisfaction depends on their perception that the destination provides protective facilities and management (Li et al., 2026), and on-site information can influence precautionary behaviour (Scholl-Grissemann et al., 2022). Destinations should invest in safety infrastructure, signage and information, and should monitor visitor segments that may be at greater risk (Jones & Yamamoto, 2015).

For regulators. The literature suggests that accidents concentrate where regulation is weakest (Bentley et al., 2001a) and that a single accident can damage a whole sector (Hansen et al., 2019b). Regulators in emerging destinations, such as Indian states introducing registration of adventure operators, should combine standards with enforcement, collect and publish data on accidents, involve industry in collaborative risk management (Hansen et al., 2019c), and evaluate whether their regulations reduce harm.

7. Limitations

This review used a single database, Scopus, and English-language journal articles, so relevant studies in other databases, languages, books and reports may have been missed. The keyword analysis depended on the keywords supplied by authors and Scopus, and the clusters may change with a different threshold. The initial screening used a list of safety- and risk-related terms, and studies that address these topics without using any of the terms may have been excluded. Eligibility was assessed on titles, abstracts and keywords, and studies were assigned to a single theme, although some address more than one. Citation counts reflect the date of the search.

8. Conclusion

Over three decades, research on safety, risk and regulation in adventure tourism has moved from counting injuries to understanding how tourists perceive risk and how guides and industries manage it. It has established that tourists seek the sensation of risk more than risk itself, that guides' skills and teams are central to safety, and that accidents concentrate in the least regulated parts of the industry. Yet current evidence on actual harm is scarce, research on emerging destinations is limited, and the design and effectiveness of regulation remain largely unexamined. As adventure tourism expands in countries such as India, closing these gaps will be essential to making adventure both thrilling and safe.

References

Ädel, A., & Östman, J.-O. (2025). Positive and negative risk in adventure tourism discourse: adrenaline hunting in "arctic Lapland". *Text and Talk, 45*(6), 725–748. https://doi.org/10.1515/text-2023-0237

Akbulut, O., Çelik, T., Ekin, Y., & Yetim, A.Ç. (2024). A research on Fethiye Babadag commercial tandem paragliding participants within the scope of experiential tourism. *Journal of Outdoor Recreation and Tourism, 47*, Article 100806. https://doi.org/10.1016/j.jort.2024.100806

Ali, F., Kement, U., Bayar, S.B., Dogan, S., & Erkol Bayram, G.E. (2025). Risk, fate, and luck: Understanding adventure intentions under the shadow of death ambiguity. *Journal of Outdoor Recreation and Tourism, 52*, Article 100970. https://doi.org/10.1016/j.jort.2025.100970

Alramamneh, I.M., Jawabreh, O., Al Fahmawee, E.A.D.A., & Nassar, U.A. (2025). The regulation of adventure tourism in Jordan legislatively and its alignment with sustainable development goals. *Geojournal of Tourism and Geosites, 63*(4), 2557–2572. https://doi.org/10.30892/gtg.634spl01-1616

Bates, K., Farrell, J.R., Kopp, S.W., & Newman, C. (2025). Love Affair With Thin Air: Mortality, Mastery, and the Consumerism of Mountaineering. *Psychology and Marketing, 42*(12), 3251–3265. https://doi.org/10.1002/mar.70038

Bentley, T.A., & Page, S.J. (2001). Scoping the extent of adventure tourism accidents. *Annals of Tourism Research, 28*(3), 705–726. https://doi.org/10.1016/S0160-7383(00)00058-X

Bentley, T.A., & Page, S.J. (2008). A decade of injury monitoring in the New Zealand adventure tourism sector: A summary risk analysis. *Tourism Management, 29*(5), 857–869. https://doi.org/10.1016/j.tourman.2007.10.003

Bentley, T.A., Cater, C.I., & Page, S.J. (2010). Adventure and ecotourism safety in Queensland: Operator experiences and practice. *Tourism Management, 31*(5), 563–571. https://doi.org/10.1016/j.tourman.2009.03.006

Bentley, T.A., Meyer, D., Page, S.J., & Chalmers, D. (2001c). Recreational tourism injuries among visitors to New Zealand: An exploratory analysis using hospital discharge data. *Tourism Management, 22*(4), 373–381. https://doi.org/10.1016/S0261-5177(00)00063-7

Bentley, T.A., Page, S.J., & Laird, I.S. (2001a). Accidents in the New Zealand adventure tourism industry. *Safety Science, 38*(1), 31–48. https://doi.org/10.1016/S0925-7535(00)00053-9

Bentley, T.A., Page, S.J., & MacKy, K.A. (2007). Adventure tourism and adventure sports injury: The New Zealand experience. *Applied Ergonomics, 38*(6), 791–796. https://doi.org/10.1016/j.apergo.2006.10.007

Bentley, T.A., Page, S.J., Meyer, D., Chalmers, D., & Laird, I.S. (2001b). How safe is adventure tourism in New Zealand? An exploratory analysis. *Applied Ergonomics, 32*(4), 327–338. https://doi.org/10.1016/S0003-6870(01)00011-4

Blackman, R.A., & Haworth, N.L. (2013). Tourist use of mopeds in Queensland. *Tourism Management, 36*, 580–589. https://doi.org/10.1016/j.tourman.2012.09.001

Bott, E. (2009). Big mountain, big name: Globalised relations of risk in himalayan mountaineering. *Journal of Tourism and Cultural Change, 7*(4), 287–301. https://doi.org/10.1080/14766820903521785

Buckley, R. (2006). *Adventure tourism*. CABI.

Buckley, R. (2010). Communications in adventure tour products: Health and safety in rafting and kayaking. *Annals of Tourism Research, 37*(2), 315–332. https://doi.org/10.1016/j.annals.2009.10.011

Buckley, R. (2012). Rush as a key motivation in skilled adventure tourism: Resolving the risk recreation paradox. *Tourism Management, 33*(4), 961–970. https://doi.org/10.1016/j.tourman.2011.10.002

Buckley, R., McDonald, K., Duan, L., Sun, L., & Chen, L.X. (2014). Chinese model for mass adventure tourism. *Tourism Management, 44*, 5–13. https://doi.org/10.1016/j.tourman.2014.01.021

Cater, C.I. (2006). Playing with risk? Participant perceptions of risk and management implications in adventure tourism. *Tourism Management, 27*(2), 317–325. https://doi.org/10.1016/j.tourman.2004.10.005

Cheng, M., Edwards, D., Darcy, S., & Redfern, K. (2018). A tri-method approach to a review of adventure tourism literature: Bibliometric analysis, content analysis, and a quantitative systematic literature review. *Journal of Hospitality & Tourism Research, 42*(6), 997–1020. https://doi.org/10.1177/1096348016640588

Cheng, T.-M., Hsu, C.-Y., & Li, S.-N. (2024). Testing the moderated mediation effect of recreation safety climate on the interrelationship of serious leisure, recreation involvement, and flow experience. *Journal of Outdoor Recreation and Tourism, 46*, Article 100762. https://doi.org/10.1016/j.jort.2024.100762

Clinch, H., & Filimonau, V. (2017). Instructors' Perspectives on Risk Management within Adventure Tourism. *Tourism Planning and Development, 14*(2), 220–239. https://doi.org/10.1080/21568316.2016.1204360

Deccan Chronicle. (2021, October 27). *Kerala makes registration must for adventure tourism activities*. https://www.deccanchronicle.com/lifestyle/travel/271021/kerala-makes-registration-must-for-adventure-tourism-activities.html

Duffy, R., & Moore, L. (2011). Global regulations and local practices: The politics and governance of animal welfare in elephant tourism. *Journal of Sustainable Tourism, 19*(4-5), 589–604. https://doi.org/10.1080/09669582.2011.566927

Duverger, P. (2025). Don't worry, be thrilled: a study of the sequential decision process of millennials and gen xers when choosing an adventure trip. *Journal of Sport and Tourism, 29*(4), 261–277. https://doi.org/10.1080/14775085.2025.2578847

Erfurt-Cooper, P. (2011). Geotourism in volcanic and geothermal environments: Playing with fire? *Geoheritage, 3*(3), 187–193. https://doi.org/10.1007/s12371-010-0025-6

Fletcher, R. (2010). The emperor's new adventure: Public secrecy and the paradox of adventure tourism. *Journal of Contemporary Ethnography, 39*(1), 6–33. https://doi.org/10.1177/0891241609342179

Fuchs, G., Reichel, A., & Shani, A. (2016). Scuba divers: The thrill of risk or the search for tranquility. *Tourism Recreation Research, 41*(2), 145–156. https://doi.org/10.1080/02508281.2016.1161159

Hansen, M., Fyall, A., & Spyriadis, T. (2020). Adventure or amusement? Image and identity challenges for the aerial adventure industry and implications for positioning and policy. *Anatolia, 31*(3), 423–435. https://doi.org/10.1080/13032917.2020.1741408

Hansen, M., Fyall, A., & Spyriadis, T. (2022). From finance to adventure: using ERM as a framework in adventure tourism. *Managing Sport and Leisure, 27*(6), 540–557. https://doi.org/10.1080/23750472.2020.1829987

Hansen, M., Fyall, A., Spyriadis, T., Rogers, D., & Brander-Brown, J. (2019c). Motivating stakeholder collaboration within the aerial adventure industry. *International Journal of Tourism Research, 21*(3), 311–322. https://doi.org/10.1002/jtr.2262

Hansen, M., Hjalager, A.-M., & Fyall, A. (2019a). Adventure tourism innovation: Benefitting or hampering operations? *Journal of Outdoor Recreation and Tourism, 28*, Article 100253. https://doi.org/10.1016/j.jort.2019.100253

Hansen, M., Rogers, D., Fyall, A., Spyriadis, T., & Brander-Brown, J. (2019b). Collaborative industry risk management in adventure tourism: A case study of the US aerial adventure industry. *Journal of Outdoor Recreation and Tourism, 28*, Article 100218. https://doi.org/10.1016/j.jort.2019.03.008

Hem, L.E., Iversen, N.M., & Nysveen, H.R. (2003). Effects of ad photos portraying risky vacation situations on intention to visit a tourist destination. *Journal of Travel and Tourism Marketing, 13*(4), 1–26. https://doi.org/10.1300/J073v13n04_01

Hendrikx, J., Johnson, J., & Shelly, C. (2015). Using GPS tracking to explore terrain preferences of heli-ski guides. *Journal of Outdoor Recreation and Tourism, 13*, 34–43. https://doi.org/10.1016/j.jort.2015.11.004

Hild, B.O., Jóhannesson, G.T., & Sydnes, A.K. (2023). "Everyone can be a guide until something goes wrong": adventure guides' competencies and tourist safety in the Arctic. *Scandinavian Journal of Hospitality and Tourism, 23*(4), 325–344. https://doi.org/10.1080/15022250.2023.2289946

Houge Mackenzie, S., & Kerr, J.H. (2012). A. (mis)guided adventure tourism experience: An autoethnographic analysis of mountaineering in Bolivia. *Journal of Sport and Tourism, 17*(2), 125–144. https://doi.org/10.1080/14775085.2012.729901

Imboden, A. (2012). Between Risk and Comfort: Representations of Adventure Tourism in Sweden and Switzerland. *Scandinavian Journal of Hospitality and Tourism, 12*(4), 310–323. https://doi.org/10.1080/15022250.2012.752624

Irina Gennadiyevna, D., Oksana Nikolaevna, B., Grigory Vladimirovich, M., & Vera Vasilyevna, E. (2014). Safety in ecological tourism. *World Applied Sciences Journal, 30*(30), 39–40. https://doi.org/10.5829/idosi.wasj.2014.30.mett.20

Irwin, A., Thacker, J., Brame, G., & Hamlet, O.E.D. (2023). 'Having a grand view of what the day entails': A qualitative investigation of the non-technical skills utilised by Mountain Guides. *Journal of Outdoor Recreation and Tourism, 43*, Article 100688. https://doi.org/10.1016/j.jort.2023.100688

Jackson, J.S. (2019). Whitewater guide safety motivation and co-worker influence. *Journal of Outdoor Recreation and Tourism, 28*, Article 100209. https://doi.org/10.1016/j.jort.2019.02.002

Jirásek, I., & Hanuš, M. (2022). "General Frost": A Nature-Based Solution and Adventure Tourism: A Case Study of Snowshoeing in Siberia. *Journal of Hospitality and Tourism Research, 46*(3), 490–517. https://doi.org/10.1177/1096348020934530

Jones, T.E., & Yamamoto, K. (2015). Segment-based monitoring of domestic and international climbers at Mount Fuji: Targeted risk reduction strategies for existing and emerging visitor segments. *Journal of Outdoor Recreation and Tourism, 13*, 10–17. https://doi.org/10.1016/j.jort.2016.01.002

Kiatkawsin, K., Bui, N.A., Hrankai, R., & Jeong, K. (2021). The moderating roles of sensation seeking and worry among nature-based adventure tourists. *International Journal of Environmental Research and Public Health, 18*(4), 1–18. https://doi.org/10.3390/ijerph18042021

King, R., & Beeton, S. (2006). Influence of mass media's coverage of adventure tourism on youth perceptions of risk. *Tourism, Culture and Communication, 6*(3), 161–169. https://doi.org/10.3727/109830406778134081

Li, Z., Kou, L., Zhang, Y., Xu, H., & Wu, H. (2026). Co-creating safe and satisfying tourist experiences: The roles of self-protective and destination-protective behaviors in adventure mountain tourism. *Journal of Hospitality and Tourism Management, 66*, Article 101377. https://doi.org/10.1016/j.jhtm.2025.101377

Løland, S., & Hallgren, M. (2025). Negotiating the gray zone: Ski guiding routine dynamics. *Annals of Tourism Research, 110*, Article 103858. https://doi.org/10.1016/j.annals.2024.103858

Luong, T.-B. (2025). Adventure tourism experiences of young Vietnamese travelers: perspectives on social media, safety, tour preferences or do-it-yourself. *Journal of Sport and Tourism, 29*(1), 21–40. https://doi.org/10.1080/14775085.2025.2484175

Luong, T.-B., & Nguyen, D.T.A. (2024). The Moderating Role of Risk Perception in the Relationships Between Motivation, Attitude, and Involvement in Adventure Activities: A Study from Young Vietnamese Travelers. *Journal of Quality Assurance in Hospitality and Tourism*. https://doi.org/10.1080/1528008X.2024.2338779

Miller, M.C., & Mair, H. (2020). Between space and place in mountaineering: navigating risk, death, and power. *Tourism Geographies, 22*(2), 354–369. https://doi.org/10.1080/14616688.2019.1654538

Ministry of Tourism. (2022, July 25). *National strategy for adventure tourism* [Press release]. Press Information Bureau. https://tourism.gov.in/sites/default/files/2022-07/PIB1844702.pdf

Mlozi, S. (2014). Loyalty program in Africa: Risk-seeking and risk-averse adventurers. *Tourism Review, 69*(2), 137–157. https://doi.org/10.1108/TR-10-2013-0057

Morgan, D.J. (2000). Adventure Tourism Activities in New Zealand: Perceptions and Management of Client Risk. *Tourism Recreation Research, 25*(3), 79–89. https://doi.org/10.1080/02508281.2000.11014927

Morgan, D.J. (2001). Risk, competence and adventure tourists: Applying the adventure experience paradigm to white-water rafters. *Leisure/ Loisir, 26*(1-2), 2–127. https://doi.org/10.1080/14927713.2001.9649931

Mu, Y., & Nepal, S. (2016). High Mountain Adventure Tourism: Trekkers' Perceptions of Risk and Death in Mt. Everest Region, Nepal. *Asia Pacific Journal of Tourism Research, 21*(5), 500–511. https://doi.org/10.1080/10941665.2015.1062787

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Page, S.J., Bentley, T.A., & Walker, L. (2005a). Scoping the nature and extent of adventure tourism operations in Scotland: How safe are they? *Tourism Management, 26*(3), 381–397. https://doi.org/10.1016/j.tourman.2003.11.018

Page, S.J., Bentley, T.A., & Walker, L. (2005b). Tourist safety in New Zealand and Scotland. *Annals of Tourism Research, 32*(1), 150–166. https://doi.org/10.1016/j.annals.2004.06.006

Piramanayagam, P., & Seal, S.P. (2017). Intervention strategies to mitigate risk in adventure tourism: A Haddon matrix perspective. *Disaster Advances, 10*(11), 21–25.

Plank, A. (2016). The hidden risk in user-generated content: An investigation of ski tourers' revealed risk-taking behavior on an online outdoor sports platform. *Tourism Management, 55*, 289–296. https://doi.org/10.1016/j.tourman.2016.02.013

Prayag, G., & Jankee, M. (2009). Exploring the Relationship Between Motives and Perceived Risks in Windsurfing: The Case of 'Le Morne', Mauritius. *Tourism Recreation Research, 34*(2), 169–180. https://doi.org/10.1080/02508281.2009.11081588

Rantala, O., Rokenes, A., & Valkonen, J. (2018). Is adventure tourism a coherent concept? A review of research approaches on adventure tourism. *Annals of Leisure Research, 21*(5), 539–552. https://doi.org/10.1080/11745398.2016.1250647

Rebelo, C.F.C., Ezequiel, G.M.G., Mendes, S.L.D.C.M., & de Jesus Carvalho, M.J.P. (2018). It is All about Safety: An Experience in Pico Mountain—Portugal. *Tourism Planning and Development, 15*(2), 134–148. https://doi.org/10.1080/21568316.2017.1303539

Schlegelmilch, F., & Ollenburg, C. (2013). Marketing the adventure: Utilizing the aspects of risk/fear/thrill to target the youth traveller segment. *Tourism Review, 68*(3), 44–54. https://doi.org/10.1108/TR-03-2013-0010

Scholl-Grissemann, U., Peters, M., Bichler, B.F., & Happ, E. (2022). Hiking tourism: educating hikers through the interpretation of on-site information and predicting precautionary behavior. *Tourism Review, 77*(6), 1436–1454. https://doi.org/10.1108/TR-01-2022-0029

Schweinsberg, S., & Hall, C.M. (2024). Sherpas and Sagarmatha: complexity theory, 'Edge of Chaos' and implications for tourism risk management. *Tourism Recreation Research*. https://doi.org/10.1080/02508281.2024.2410584

Selem, K.M., Sinha, R., Khalid, R., Raza, M., & Islam, M. (2024). Trade-off between future travel avoidance and self-protectiveness post-COVID-19: the roles of adventurousness and safety-seeking tendency. *Journal of Hospitality and Tourism Insights, 7*(1), 227–248. https://doi.org/10.1108/JHTI-09-2022-0432

Silori, C. (2004). Socio-economic and ecological consequences of the ban on adventure tourism in Nanda Devi Biosphere Reserve, western Himalaya. *Biodiversity and Conservation, 13*(12), 2237–2252. https://doi.org/10.1023/B:BIOC.0000047922.06495.27

Soundararajan, S., Singh, U., & Gera, M. (2023). Adventure Tourism: Behavioural Drivers to Visit and Spread Word of Mouth with Perceived Risk as Moderator. *Global Business Review*. https://doi.org/10.1177/09721509231202000

Spector, S. (2020). Delineating acceptable risk in the space tourism industry. *Tourism Recreation Research, 45*(4), 500–510. https://doi.org/10.1080/02508281.2020.1747798

Stanbury, J., Pryer, M., & Roberts, A. (2005). Heroes and villains - Tour operator and media response to crisis: An exploration of press handling strategies by UK adventure tour operators. *Current Issues in Tourism, 8*(5), 394–423. https://doi.org/10.1080/13683500508668225

Teng, W., Chen, Y., & Zhang, S. (2025). A Study on Travel Decisions of Potential Adventure Tourists Under Risk Contexts: Based on the Extended Theory of Planned Behavior. *SAGE Open, 15*(2). https://doi.org/10.1177/21582440251335806

Uriely, N., Schwartz, Z., Cohen, E., & Reichel, A. (2002). Rescuing hikers in Israel's deserts: Community altruism or an extension of adventure tourism? *Journal of Leisure Research, 34*(1), 25–36. https://doi.org/10.1080/00222216.2002.11949958

von der Dunk, F.G. (2011). Space tourism, private spaceflight and the law: Key aspects. *Space Policy, 27*(3), 146–152. https://doi.org/10.1016/j.spacepol.2011.04.015

Walle, A.H. (1997). Pursuing risk or insight: Marketing Adventures. *Annals of Tourism Research, 24*(2), 265–282. https://doi.org/10.1016/s0160-7383(97)80001-1

Wang, J., Liu-Lastres, B., Ritchie, B.W., & Pan, D.-Z. (2019). Risk reduction and adventure tourism safety: An extension of the risk perception attitude framework (RPAF). *Tourism Management, 74*, 247–257. https://doi.org/10.1016/j.tourman.2019.03.012

Williams, P., & Soutar, G. (2005). Close to the "Edge": Critical issues for adventure tourism operators. *Asia Pacific Journal of Tourism Research, 10*(3), 247–261. https://doi.org/10.1080/10941660500309614

Xu, Q., Jiang, J., Wang, M., & Huang, Y. (2025). The dynamics of personality, risk, and choice: an oprobit analysis of adventure tourism preferences. *Current Issues in Tourism*. https://doi.org/10.1080/13683500.2025.2503339

Zaid, S., Abadi, S.Y., & Kamaluddin, M. (2023). Adventure tourism risk, environmental image, and revisit intention: An empirical study of underwater cave diving tourism in Buton Island, Indonesia. *Tourism and Hospitality Management, 29*(1), 15–24. https://doi.org/10.20867/thm.29.1.2

Zhu, D., & Xu, H. (2022). Novice tourists' play experience in commercial outdoor adventure tourism: The perspective of reversal theory. *Journal of Outdoor Recreation and Tourism, 39*, Article 100529. https://doi.org/10.1016/j.jort.2022.100529

Appendix

Table A1 *Studies Included in the Review (n = 74)*

Study	Theme	Method	Focus
Bentley et al., 2001a	Accidents and injuries	Quantitative	Client accident incidence and operators' accident reporting, New Zealand; under-reporting among small, less regulated operators
Bentley et al., 2001b	Accidents and injuries	Quantitative	Hospital and mortality data on adventure tourism injuries and fatalities, New Zealand
Bentley et al., 2001c	Accidents and injuries	Quantitative	Recreational and adventure injuries among overseas visitors from hospital data, New Zealand
Bentley & Page, 2001	Accidents and injuries	Quantitative	Scope and extent of adventure tourism accidents from compensation and other records, New Zealand
Page et al., 2005b	Accidents and injuries	Quantitative	Comparative safety experiences of adventure operators, New Zealand and Scotland
Page et al., 2005a	Accidents and injuries	Quantitative	National survey of Scotland's adventure operators, markets and injury rates
Bentley et al., 2007	Accidents and injuries	Quantitative	Injury compensation claims in adventure tourism and sport, New Zealand
Bentley & Page, 2008	Accidents and injuries	Quantitative	Summary risk analysis of a decade of injury studies in New Zealand
Bentley et al., 2010	Accidents and injuries	Mixed	Client injuries and safety management practices of Queensland operators
Blackman & Haworth, 2013	Accidents and injuries	Quantitative	Crash involvement of tourists using rental mopeds and licensing rules, Queensland

Study	Theme	Method	Focus
Morgan, 2000	Risk management	Conceptual	Model of client risk perception and control and a process for industry standardisation
Williams & Soutar, 2005	Risk management	Conceptual	Market pressure leading operators to cut corners on safety and sustainability
Buckley, 2010	Risk management	Qualitative	Communication of health and safety in rafting and kayaking tours across 19 countries
Buckley et al., 2014	Risk management	Qualitative	China's mass river-rafting model and its implications for safety expectations
Hendrikx et al., 2015	Risk management	Quantitative	GPS analysis of heli-ski guides' terrain choices under avalanche hazard
Clinch & Filimonau, 2017	Risk management	Qualitative	Instructors' perceptions and management of risk; corner-cutting under profit pressure, UK
Piramanayagam & Seal, 2017	Risk management	Conceptual	Haddon matrix framework to identify and mitigate adventure tourism risks
Rebelo et al., 2018	Risk management	Quantitative	Visitor profile and the value of guides for safety, Pico Mountain, Portugal
Jackson, 2019	Risk management	Qualitative	Co-worker influence on whitewater guides' safety motivation
Hansen et al., 2019b	Risk management	Qualitative	Case for an industry-wide approach to risk management, US aerial adventure parks
Hansen et al., 2019a	Risk management	Qualitative	Effects of innovation on operational risk management, US aerial adventure industry
Hansen et al.,	Risk	Qualitative	Motives for stakeholder collaboration to improve

Study	Theme	Method	Focus
2019c	management		risk management, US aerial adventure industry
Hansen et al., 2022	Risk management	Qualitative	Enterprise risk management as a framework for the aerial adventure industry
Jirásek & Hanuš, 2022	Risk management	Qualitative	Weather-driven risk management as a nature-based solution, winter snowshoeing in Siberia
Irwin et al., 2023	Risk management	Qualitative	Non-technical skills used by mountain guides to maintain safety
Hild et al., 2023	Risk management	Qualitative	Competencies guides need to ensure tourist safety in the Arctic
Cheng et al., 2024	Risk management	Quantitative	Recreation safety climate as a moderator of involvement and flow, scuba divers, Taiwan
Schweinsberg & Hall, 2024	Risk management	Conceptual	Complexity theory and the distribution of risk among stakeholders on Everest
Løland & Hallgren, 2025	Risk management	Qualitative	How ski guides adapt routines to uncertainty in avalanche terrain, Norway
Morgan, 2001	Tourists' risk perception	Quantitative	Risk, competence and the adventure experience paradigm among whitewater rafters
Hem et al., 2003	Tourists' risk perception	Experimental	Effect of risky vacation photographs in advertising on intention to visit
King & Beeton, 2006	Tourists' risk perception	Not stated	Effect of media coverage of accidents on youth risk perception and participation
Prayag & Jankee, 2009	Tourists' risk perception	Mixed	Motives and perceived risks of international windsurfers, Mauritius

Study	Theme	Method	Focus
Mlozi, 2014	Tourists' risk perception	Quantitative	Risk-seeking and risk-averse segments in the attractiveness–satisfaction–loyalty chain, Tanzania
Jones & Yamamoto, 2015	Tourists' risk perception	Quantitative	Monitoring domestic and international climber segments for targeted risk reduction, Mount Fuji
Plank, 2016	Tourists' risk perception	Quantitative	Risk-taking revealed in user-generated ski-tour content and avalanche danger
Mu & Nepal, 2016	Tourists' risk perception	Qualitative	Trekkers' perceptions of risk and death in the Everest region, Nepal
Wang et al., 2019	Tourists' risk perception	Mixed	Risk perception attitudes, worry and safety behaviour of tidal-bore visitors, China
Kiatkawsin et al., 2021	Tourists' risk perception	Quantitative	Sensation seeking and worry as moderators of adventure participation intention
Scholl-Grissemann et al., 2022	Tourists' risk perception	Experimental	On-site information, hiking motives and precautionary behaviour (experiment)
Zaid et al., 2023	Tourists' risk perception	Quantitative	Dimensions of perceived risk, environmental image and revisit intention, cave diving, Indonesia
Soundararajan et al., 2023	Tourists' risk perception	Quantitative	Perceived risk as a moderator of drivers of visit and word-of-mouth intention, India
Selem et al., 2024	Tourists' risk perception	Quantitative	Adventurousness, travel anxiety and self-protective behaviour after COVID-19, Egypt
Luong & Nguyen, 2024	Tourists' risk perception	Quantitative	Risk perception as a moderator of motivation, attitude and involvement, young Vietnamese travellers

Study	Theme	Method	Focus
Akbulut et al., 2024	Tourists' risk perception	Quantitative	Risk, benefit, trust and satisfaction among tandem paragliding participants, Türkiye
Teng et al., 2025	Tourists' risk perception	Quantitative	Inverted-U effect of perceived risk on potential adventure tourists' travel intention
Ali et al., 2025	Tourists' risk perception	Quantitative	Luck, fatalism and risk attitudes in intention to undertake wingsuit flying
Xu et al., 2025	Tourists' risk perception	Quantitative	Personality traits, risk preference and choice of hard or soft adventure
Luong, 2025	Tourists' risk perception	Qualitative	Social media, safety concerns and preference for organised tours, young Vietnamese travellers
Duverger, 2025	Tourists' risk perception	Experimental	Effects of perceived risk, thrill and knowledge on generational decisions to book adventure trips
Li et al., 2026	Tourists' risk perception	Mixed	Tourists' self-protective and destination-protective behaviour and satisfaction, mountain tourism, China
Walle, 1997	Risk as product	Conceptual	Distinction between risk-seeking and insight-seeking adventure for marketing
Cater, 2006	Risk as product	Not stated	Participants seek fear and thrill rather than actual risk; operators commodify thrill while reducing risk
Bott, 2009	Risk as product	Conceptual	Globalised relations of risk between Western climbers and Sherpa guides
Fletcher, 2010	Risk as product	Qualitative	'Public secrecy' that lets tourists feel both safe and at risk in whitewater rafting
Imboden, 2012	Risk as product	Qualitative	Representation of adventure as both safe and thrilling by tourism boards, Sweden and

Study	Theme	Method	Focus
			Switzerland
Buckley, 2012	Risk as product	Qualitative	'Rush', not risk, as the key motivation in skilled adventure tourism
Houge Mackenzie & Kerr, 2012	Risk as product	Qualitative	Autoethnography of risk perception and the protective frame in guided mountaineering, Bolivia
Schlegelmilch & Ollenburg, 2013	Risk as product	Mixed	Use of risk, fear and thrill appeals in viral marketing to youth travellers
Fuchs et al., 2016	Risk as product	Qualitative	Scuba divers' balance between risk and tranquillity
Miller & Mair, 2020	Risk as product	Qualitative	Sherpas' experiences of risk, death and power in commercial mountaineering
Zhu & Xu, 2022	Risk as product	Qualitative	Balancing perceived risk and the 'protective frame' in novice ziplining
Ädel & Östman, 2025	Risk as product	Qualitative	Discursive construction of positive and negative risk on Arctic adventure websites
Bates et al., 2025	Risk as product	Qualitative	Mortality salience and meaning in mountaineering consumption
Uriely et al., 2002	Regulation and governance	Quantitative	Motives of volunteer desert rescuers and their attribution of blame to rescued hikers, Israel
Silori, 2004	Regulation and	Mixed	Ecological and socio-economic consequences of

Study	Theme	Method	Focus
	governance		banning adventure tourism, Nanda Devi, India
Stanbury et al., 2005	Regulation and governance	Qualitative	Press-handling strategies of UK adventure tour operators after crises
Erfurt-Cooper, 2011	Regulation and governance	Conceptual	Risk management for tourism in active volcanic and geothermal environments
Duffy & Moore, 2011	Regulation and governance	Qualitative	Global standards and local practice in the governance of elephant welfare in tourism
von der Dunk, 2011	Regulation and governance	Conceptual	Legal issues of authorisation, liability and certification in space tourism
Irina Gennadiyevna et al., 2014	Regulation and governance	Conceptual	Natural, social and epidemiological dangers and tourist safety in ecological and adventure tourism
Hansen et al., 2020	Regulation and governance	Qualitative	Identity of aerial adventure parks (adventure or amusement) and implications for inspection and policy
Spector, 2020	Regulation and governance	Conceptual	Defining acceptable risk in the emerging space tourism industry
Alramamneh et al., 2025	Regulation and governance	Qualitative	Legal framework for adventure tourism in Jordan and its alignment with the SDGs