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Seguridad Turística e Indicadores Sociales de los Destinos Turísticos: Un Estudio Bibliométrico del Siglo XXI

Tourism Security and Social Indicators of Tourism Destinations: A Bibliometric Study of the 21st Century

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Resumen

La seguridad en un destino turístico está relacionada con los indicadores sociales del destino, afectando tanto la calidad de los viajes de los turistas como la calidad de vida de los residentes. Por lo tanto, es necesario estudiar el vínculo entre la seguridad turística y los indicadores sociales. Sin embargo, la investigación en este campo es escasa y falta una discusión general. Este estudio proporciona una revisión exhaustiva de la literatura sobre la seguridad turística y los indicadores sociales mediante un análisis bibliométrico, un análisis de redes y un análisis cuantitativo para ofrecer una visión concisa y holística. Los resultados de esta revisión proporcionan a las autoridades turísticas medios para mejorar la calidad de los indicadores sociales en los destinos, como el transporte, el ocio, los medios de comunicación y la cultura, la seguridad pública y el

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crimen, y la situación general de vida. Además, también proporciona una nueva dirección para futuras investigaciones, añadiendo al acervo de conocimientos en el campo.

Palabras clave: seguridad turística, indicador social, imagen del destino, análisis bibliométrico, PRISMA.

Abstract

Security in a tourism destination is related to the social indicators of the destination, affecting both the quality of tourists' trips and residents' quality of life. Therefore, it is necessary to study the link between tourism safety and social indicators. However, research in this field is scarce, and a general discussion is absent. This study provides a comprehensive review of the literature on tourism security and social indicators through bibliometric analysis, network analysis, and quantitative analysis to offer a concise and holistic overview. The results of this review provide tourism authorities with means to improve the quality of social indicators in destinations, such as transportation, leisure, media and culture, public safety and crime, and the general life situation. In addition, it also provides a new direction for future research adding to the knowledge base of the field.

Key words: tourism security, social indicator, destination image, bibliometric analysis, PRISMA.

1 Introduction

Urban areas have become popular tourist destinations (Zekan & Wöber, 2022). In addition, common public spaces in cities—such as museums, parks, and city squares—are gathering places for tourists (Griffin et al., 2010). When tourists enter a city, they become temporary residents of the city (Goodwin, 2016), sharing the same living space with local residents. However, these free public spaces are also outdoor space gathering places for low-income workers, foreign migrant workers, and teenagers (Huang et al., 2024). Due to large population flows and complex compositions, the safety of tourists has gradually attracted attention. Unfortunately, there is no sufficiently-credible official data to evaluate the tourism security of destinations, which hinders the development of research in this field.

Given the premise that residents and tourists share space at the destination, the prevailing social conditions of a destination affects both of their quality of life; these conditions differ by destination and have varying degrees of impact on residents and tourists. Social indicators can be defined as

'indexes of the state of a society and the changes taking place within it' (Land, 1983), which have broad significance and applications, potentially reflecting the well-being goals of government policies or programmes to some extent. Social indicators concretise complex social issues in numerical representations and provide relatively objective data-evaluation standards for tourism security research. Social indicators attempt to capture increasingly complex, dynamic, and interconnected social phenomena and realities, and social indicator quality indicates residents' subjective well-being, life satisfaction, and quality of life (Aria et al., 2020). Specifically, the quality of social indicators in a region represents its social conditions and quality of life; it affects the daily activities of all those who live there for any amount of time or even just pass through, as well as the main needs of residents at different life stages. The scope of assessment of social indicators is broad, with European social indicators divided into the following 14 items (Bericat et al., 2019):

> *Population, households and families, housing, transport, leisure, media and culture, social and political participation and integration, education and vocational training, labour market and working conditions, income, standard of living and consumption patterns, health, environment, social security, public safety and crime, and total life situation.*

Even though the subjects of social indicator assessment do not include tourists, the correlation between social indicators and tourism security is clear when tourists are conceptualised as temporary residents (Brollo & Celata, 2023). From the moment they arrive at their destination, travellers are profoundly affected by local social conditions.

The security of tourism destinations is a top priority for countries aiming to develop their tourism industry (Ali et al., 2018). This study focuses on tourism security as defined by Pizam & Mansfeld (2006), specifically human-made tragedies such as criminal issues or intra-/international conflicts, which remain underexplored in the current body of research (Dogru-Dastan & Tütüncü, 2024). Furthermore, although previous literature reviews have made significant contributions to the understanding of tourism safety within existing databases, they have largely overlooked the connection between tourism security and local societal and quality of life factors. Additionally, these reviews exhibit limitations in database coverage and analytical methods (e.g., Amaro et al., 2023; Díaz-Pompa et al., 2023; Toker & Emir, 2023; Wang et al., 2019).

This study aims to integrate and analyse all research related to tourism security and social indicators available in the two major global databases, Web of Science (WoS) and Scopus, while

providing recommendations for future research directions. Following the PRISMA guidelines, we systematically screened relevant scientific literature and explored the evolution of citations, key journals, author keywords, and publication trends in this field during the 21st century. Additionally, we constructed networks of national collaborations, author collaborations, and author keywords to provide a comprehensive overview. By utilising advanced analytical tools, including Gephi and Python, and employing topic modelling, we identified the focal points of this research domain in the 21st century and quantify the relationship between tourism security and social indicators. These contributions not only complement existing literature compilations on tourism security but also advance the field by offering methodological improvements and new perspectives for researchers.

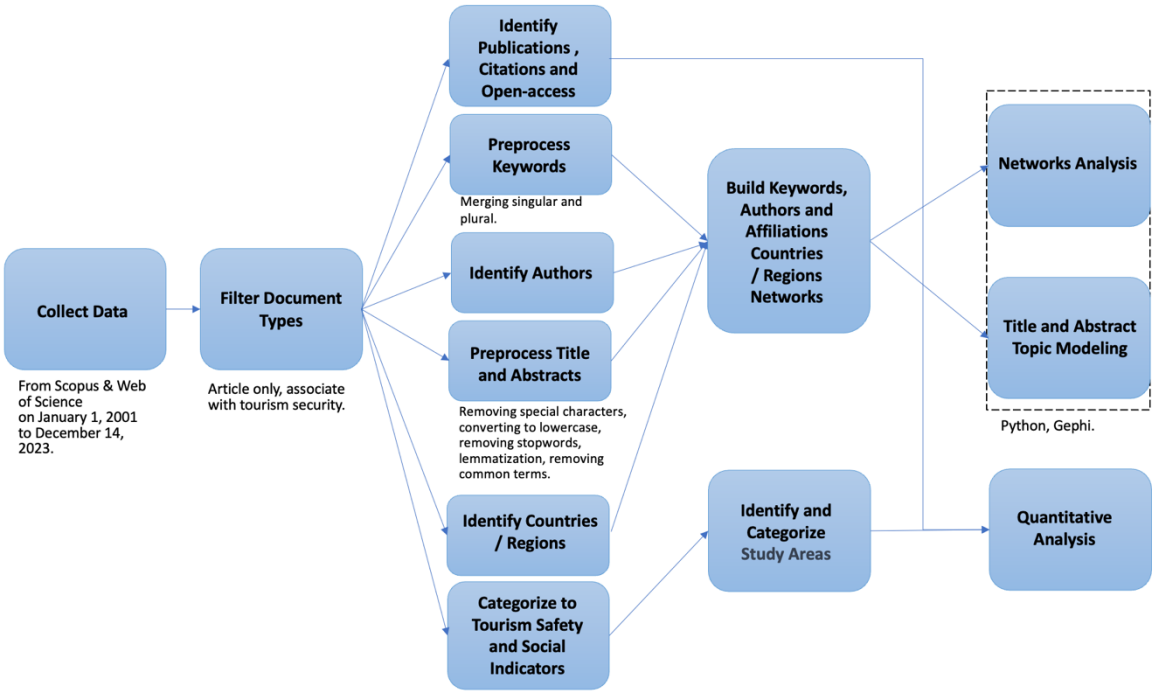
2 Study methods and materials

To achieve its aims, this study categorises findings from the existing 21st-century literature and establishes their links to tourism security and European social indicators. In this study, English-language scientific literature published in the twenty-first century (2001–2023) was obtained from two databases—Scopus and Web of Science (WoS)—using precise search terms and, after screening (including grey literature), was analysed by means of a literature metrics analysis.

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) is an evolving set of guidelines which provides scholars with a reference to the steps and conditions of knowledge synthesis methods, in order to ensure accurate and transparent results in their studies (Sarkis-Onofre et al., 2021).

In this study, PRISMA was used as a criterion to match the research attributes, with the detailed methodology shown below (Figure 1).

Figure 1. Research design diagram.



Source: own elaboration

2.1 Data collection

The data for this study included 21st-century publications—specifically, publications from 1 January 2001 to 14 December 2023—in this field. The data was collected on 15 December 2023 through two literature databases, Scopus and WOS, using search strings (Table 1). A total of 497 publications from the Scopus database and 322 publications from the WoS database were obtained. After removing articles unrelated to the target topic—those on natural disasters and infectious diseases etc.—119 articles remained in the Scopus database set and 52 articles remained in the WoS database set. After duplicates across both databases were deleted, the final dataset consisted of 122 articles, which all related to human-made tragedies.

Table 1. Search strings

Database	The exact search
Scopus	DOCTYPE (ar) AND LANGUAGE (english) AND PUBYEAR < 2024 AND PUBYEAR > 2000 AND TITLE ((touris* OR travel*) AND (safe* OR secur*)) AND ABS (safe* OR secur* OR danger* OR risk* OR terror* OR crim* OR victim* OR damag* OR imag* OR war* OR unrest*)
WoS	(((((TI=(((touris* OR travel*) AND (safe* OR secur*))) AND AB=(safe* OR secur* OR danger* OR risk* OR terror* OR crim* OR victim* OR damag* OR imag* OR war* OR unrest*))) AND LA=(English)) AND DT=(Article)) AND PY=(2001-2023)) AND (EDN==("WOS.SSCI" OR "WOS.SCI" OR "WOS.AHCI"))

Source: own elaboration

2.2 Text preprocessing

Text preprocessing plays an extremely important role in text mining, as it not only improves the accuracy of the algorithm but also helps reduce computational complexity, standardise the text data, and enhance the readability of the text; therefore, it is a step that should not be overlooked (Bird et al., 2009).

We used the Python suite NLTK (Natural Language Toolkit) for stopword removal (e.g., 'the', 'with', 'from', etc.), text cleaning (text to lowercase and specific phrase substitution, e.g., 'sri lanka' to 'sri_lanka'), tokenisation, part-of-speech tagging, and lemmatisation. We also added custom stopwords, or words which often appear in abstracts but are not useful for text analysis, e.g., 'research', 'article', 'analysis', 'results', 'findings', 'data', 'elsevier ltd', and so on.

2.3 Network data

Network analysis of author keywords can be used to visualise the links between core and subsidiary concepts of research in the field. Additionally, author and country network analysis can identify patterns of collaboration and the impact of current research in academia, including key participants and clusters (António & Rita, 2023).

Before proceeding with converting the data to network format, this study improved the problem of data quality. In the author keyword network section, abbreviated keywords and full terms were merged (e.g., 'WOM' keywords were included in 'word of mouth') to solve the problem of text variability. For the author collaboration network diagram, three authors used different spellings for their names in their publications, and after identifying that they were the same person, we

standardised their names (specifically, Mawby, R. I. to Mawby, R., Hall, M. C. to Hall, C. M., and Santana Gallego, M. to Santana-Gallego, M.). The network analysis and visualisation in this study was conducted using Python and Gephi. For the Gephi network analysis, two files (Nodes and Edges) were set up. The description is shown in Table 2.

Table 2. The datasets for the network analysis

Type of network	Dataset	Illustration
Keywords' networks	Nodes	Each keyword and its frequency (number of articles in which the keyword appears).
	Edges	Pairs of keywords, the frequency of both keywords appearing in the same article, and the total citations for the articles in which both keywords were present.
Authors' networks	Nodes	Each author and their frequency (number of articles in which the author appears).
	Edges	Pairs of authors, the frequency of both authors appearing in the same article, and the total citations of the articles in which both authors were present.
Locations' networks	Nodes	Each author's country and its frequency (number of articles in which the country appears).
	Edges	Pairs of countries, the frequency of both countries appearing in the same article, and the total citations for the articles in which both countries were present.

Source: own elaboration

2.4 Topic modelling

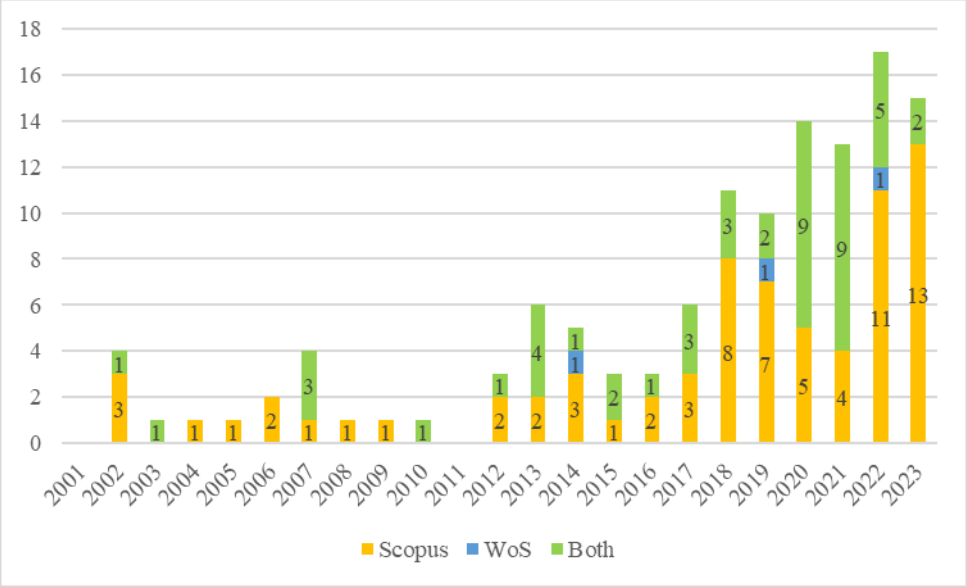
This study used topic modelling, an unsupervised machine learning approach, for the content analysis of titles and abstracts. Latent Dirichlet allocation (LDA), a common technique in topic modelling (Blei et al., 2003), effectively identifies research topics from a large number of documents with minimal human intervention by means of probabilistic modelling (Koseoglu et al., 2022). We combined the title and abstract of each article into a single document and analysed it in Python using the Gensim package. To identify the optimal number of topics, we relied on the calculation of topic coherence and similarity (Ligorio et al., 2022). Finally, each topic was composed of a set of words, and the topics were named by the researcher's own sensitivity to the field.

3 Results

3.1 Publications and citations

This field has been under-researched throughout the twenty-first century: it is only after 2018 that the number of publications per year has increased to double digits and kept increasing year after year (Figure 2). The study by Kaszás & Keller (2022) shows that although tourism security is included in the policy formulation of the European Union (EU) member states, this has not been translated into actual practice; for most EU countries, the field is still in its infancy. The reason why the number of publications in the area of tourism security has begun to increase may be due to a series of calamities (e.g., the refugee crisis in Europe, the terrorist attacks in Madrid, Barcelona, and London, the North Korean nuclear tests, the Arab Spring) which not only raised tourists' perceptions of tourism security but also attracted the attention of academics to this area. For example, Marine-Roig & Huertas' (2020) study shows that terrorist attacks have a negative impact on the image of a destination, which, may be exacerbated by international media coverage, thus influencing tourists' safety perceptions.

Figure 2. Number of publications in each year

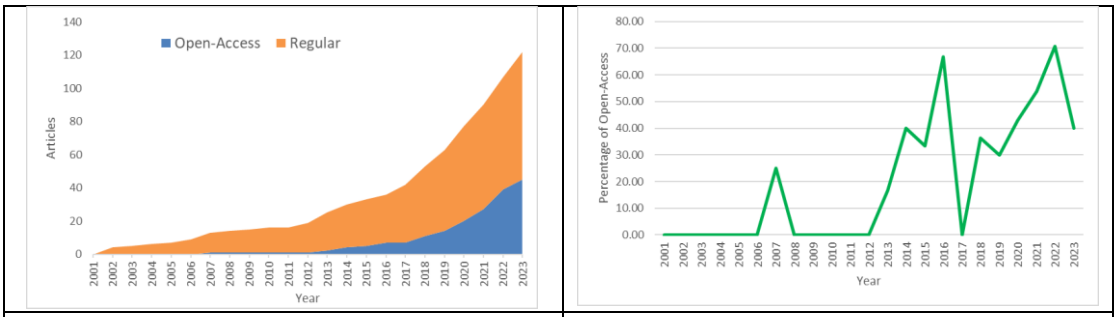


Source: own elaboration

With the evolution of international trends (Piwowar et al., 2018), the increasing availability of tools (Greshake, 2017), and changing consumer usage habits (Antelman, 2017), open-access article is gradually replacing regular article as a primary method for disseminating scientific literature. Given that tourism security is an emerging field, further research is needed to explore the dissemination methods of scientific literature within this domain.

The number of open-access articles accounts for 36.9% of the total and has increased every year since the turn of the century. The proportion of open-access articles has been increasing since 2012, and although the proportion has shown a downward trend in some years, the overall direction is upwards (Figure 3a), reaching 70.6% of the total in 2022 (Figure 3b). The increase in the number of open-access articles may be due to several reasons. For one thing, authors may believe that increasing the access to their articles will help increase the citation rate (António & Rita, 2023).

Figure 3. Articles published over the years.



(a) Cumulative publication, according to type | (b) Percentage of open-access articles

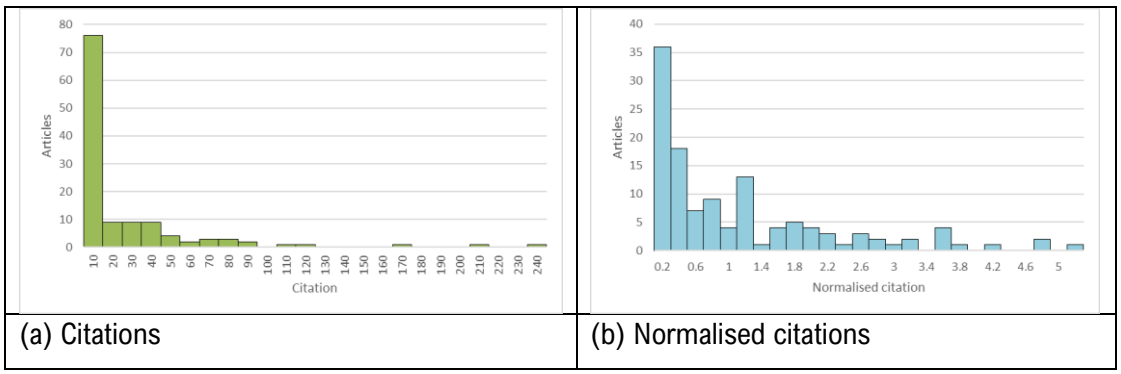
Source: own elaboration

To compare the citation impact across different fields, it is essential to normalise the citation impact of scientific literature published in various domains to eliminate unnecessary noise (Bornmann, 2020). This is the primary reason for applying citation normalisation in this study.

In addition, the development of digital technology has made it easier to disseminate information on a large scale, increasing the feasibility of open-access. However, Kruskal-Wallis tests showed that the difference in citation counts between regular and open-access articles and the difference in normalised citation counts were not statistically significant, suggesting that research article access is not the key factor affecting citation counts in this field.

Most of the articles had citation counts between 0 and 10, with the highest citation counts falling between 230 and 240 (Figure 4a). Articles with normalised citation counts of four or more (4.2, 4.8, and 5.2) dominated the top three places (Figure 4b).

Figure 4. Histograms of citations.



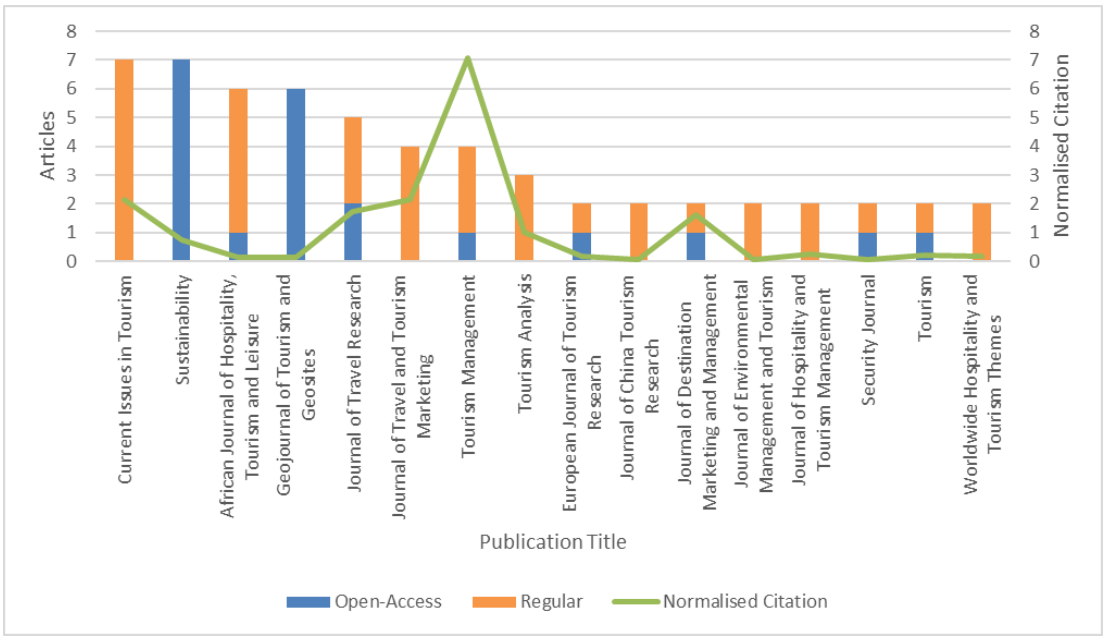
(a) Citations | (b) Normalised citations

Note: Normalised citations: The number of citations of an article divided by the average number of citations of the article in that year.

Source: own elaboration

The 122 articles analysed in this study were published in 80 journals. Figure 5 lists the journals with 2 or more articles (16 journals in total), showing their open-access and regular articles along with normalised citations. Overall, Tourism Management has the highest number of normalised citations and the highest impact. In addition, the journals with high normalised citations in this research area host mostly regular articles, which is very different from open-access articles; this may be because some journals with high normalised citations only allow their articles to be published as regular articles. It is also possible that authors have different ideas about the connection between article access and citation counts.

Figure 5. Open-access and regular articles, and normalised citations, per journal.



Source: own elaboration

In terms of the top ten citations, *Tourism Management* contained more articles with high citation counts (4 articles, Table 2). In terms of normalised citations, *Journal of Travel Research* contained the most articles with high normalised citations (3 articles, Table 3), and all of them were published relatively recently (2020–2023). In addition, both journals showed a yearly increase in Impact Factor Trend in the twenty-first century, indicating a significant impact in this field of study. Of these highly-cited articles, five of them dealt with tourists' safety perceptions (4 regular, 1 open-access), one dealt with the impact of security threats on international tourist flows (regular), and one dealt with the impacts of security threats on direct, indirect, and induced spillovers from tourism (open-access). Most of the articles related to tourists' safety perceptions are regular articles, indicating that the level of access does not have a significant impact on the research in this area.

Table 2. Top 10 articles by citations.

Authors	Title	Year	Source title	Citations	Normalised Citation Score	Data source	Access status
George, R.	Tourist's perceptions of safety and security while visiting Cape Town	2003	Tourism Management	234	1.00	Both	R
Seabra, C., Dolnicar, S., Abrantes, J.L., Kastenholz, E.	Heterogeneity in risk and safety perceptions of international tourists	2013	Tourism Management	200	3.44	Both	O
Hall, C.M.	Travel safety, terrorism and the media: The significance of the issue-attention cycle	2002	Current Issues in Tourism	164	2.62	Scopus	R
Hall, C.M., Duval, D.T., Timothy, D.J.	Security and tourism: Towards a new understanding?	2004	Journal of Travel and Tourism Marketing	118	1.00	Scopus	R
Bianchi, R.	Tourism and the Globalisation of Fear: Analysing the Politics of Risk and (in)Security in Global Travel	2006	Tourism and Hospitality Research	104	1.58	Scopus	R
Woosnam, K.M., Shafer, C.S., Scott, D., Timothy, D.J.	Tourists' perceived safety through emotional solidarity with residents in two Mexico-United States border regions	2015	Tourism Management	88	2.05	Both	R
Blalock, G., Kadiyali, V., Simon, D.H.	The impact of post-9/11 airport security measures on the demand for air travel	2007	Journal of Law and Economics	86	3.41	Both	R
Fourie, J., Rosselló-Nadal, J., Santana-Gallego, M.	Fatal Attraction: How Security Threats Hurt Tourism	2020	Journal of Travel Research	79	4.08	Both	R
Boakye, K.A.	Tourists' views on safety and vulnerability. A study of some selected towns in Ghana	2012	Tourism Management	77	2.48	Both	R
Ghaderi, Z., Saboori, B., Khoshkam, M.	Does security matter in tourism demand?	2017	Current Issues in Tourism	74	4.67	Both	R

Source: own elaboration

Table 3. Top 10 articles by normalised citations

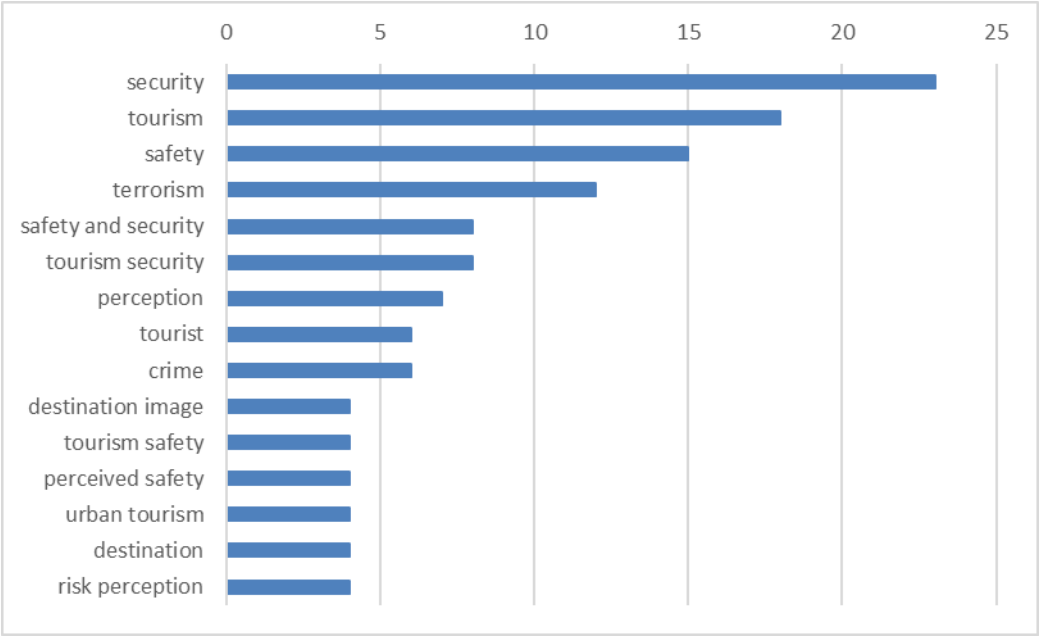
Authors	Title	Year	Source title	Citations	Normalised Citation Score	Data source	Access status
Zou Y., Yu Q.	Sense of safety toward tourism destinations: A social constructivist perspective	2022	Journal of Destination Marketing and Management	21	5.03	Both	O
Ghaderi, Z., Saboori, B., Khoshkam, M.	Does security matter in tourism demand?	2017	Current Issues in Tourism	74	4.67	Both	R
Mirehie, M., Liu-Lastres, B., Cecil, A., Jain, N.	Business travel, risk, and safety of female university faculty and staff	2023	Annals of Leisure Research	4	4.62	Scopus	O
Fourie, J., Rosselló-Nadal, J., Santana-Gallego, M.	Fatal Attraction: How Security Threats Hurt Tourism	2020	Journal of Travel Research	79	4.08	Both	R
Xie, C., Zhang, J., Morrison, A.M.	Developing a Scale to Measure Tourist Perceived Safety	2021	Journal of Travel Research	37	3.70	Both	O
Akamavi, R.K., Ibrahim, F., Swaray, R.	Tourism and Troubles: Effects of Security Threats on the Global Travel and Tourism Industry Performance	2023	Journal of Travel Research	3	3.46	Scopus	O
Seger-Guttmann, T., Gilboa, S.	The role of a safe service environment in tourists' trust and behaviors–the case of terror threat	2023	Journal of Hospitality and Tourism Management	3	3.46	Both	R
Seabra, C., Dolnicar, S., Abrantes, J.L., Kastenholz, E.	Heterogeneity in risk and safety perceptions of international tourists	2013	Tourism Management	200	3.44	Both	O
Blalock, G., Kadiyali, V., Simon, D.H.	The impact of post-9/11 airport security measures on the demand for air travel	2007	Journal of Law and Economics	86	3.41	Both	R
Stankova, M., Tsvetkov, T., Ivanova, L.	Tourist development between security and terrorism: Empirical evidence from Europe and the United States	2019	Oeconomia Copernicana	15	3.06	Both	O

Source: own elaboration

3.2 Keywords

'Security' (Ko & Song, 2021a; Zhao & Abili, 2019) was the most frequently occurring keyword in this field, in line with previous reviews (e.g., Amaro et al., 2023; Toker & Emir, 2023). Other frequently occurring keywords included 'safety' (Ko & Song, 2021b; Wu & Cheng, 2022) and 'tourism security' (Ghaderi et al., 2017; Kaszás, & Keller, 2022). Notably, 'terrorism' (Agarwal et al., 2021; Fourie et al., 2020) and 'crime' (Malleka et al., 2022) were the most relevant destination travel risks for travellers (Fourie et al., 2020). Finally, 'perceived safety' (Woosnam et al., 2015; Xie et al., 2021) and 'destination image' (Collins & Millar, 2021; Millar et al., 2017) were also issues of interest to the field (Figure 6).

Figure 6. Top 15 keywords (after preprocessing)

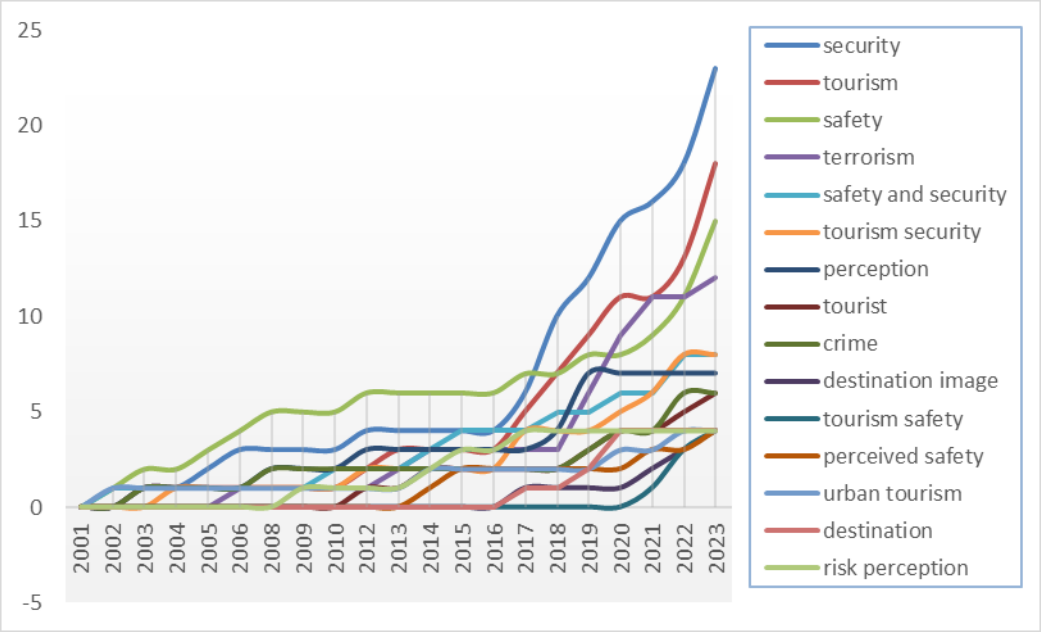


Source: own elaboration

In an observation of the evolution of the top 15 keywords over time (Figure 7) apart from 'security' (Wu & Cheng, 2022), the terms 'tourism' (Shin, 2005) and 'safety' (Millar et al., 2017) stand out in terms of cumulative frequency over the past 23 years, with 'terrorism' moving from 7th to 4th place in just 5 years (2018–2023). Scholars in the target field have used the terms 'safety' and 'security' to varying degrees to refer to human-made tragedies. Some have also employed the combined term 'safety and security' to simultaneously address topics such as natural disasters and infectious diseases. It is worth noting that 'security' first overtook 'safety' in the 2017 keyword rankings to become number one, where it has remained ever since.

The definitions of 'security' and 'safety' have always been ambiguous in this field. Some scholars believe that the two words are indistinguishable and can be used interchangeably or can be referred to at the same time (Mbane & Ezeuduji, 2022; Millar et al., 2017). Other scholars argue that 'security' refers to events which intentionally cause harm to tourists (e.g., crimes, terrorist attacks), while 'safety' refers to events which unintentially cause harm to tourists (Agarwal et al., 2021; Kaszás & Keller, 2022). The fact that 'security' has become a more common keyword than 'safety' may imply that there is only a confusion of definitions, or it may imply that 'acts which cause intentional harm to tourists' has become a focus of academic research and is worthy of further study.

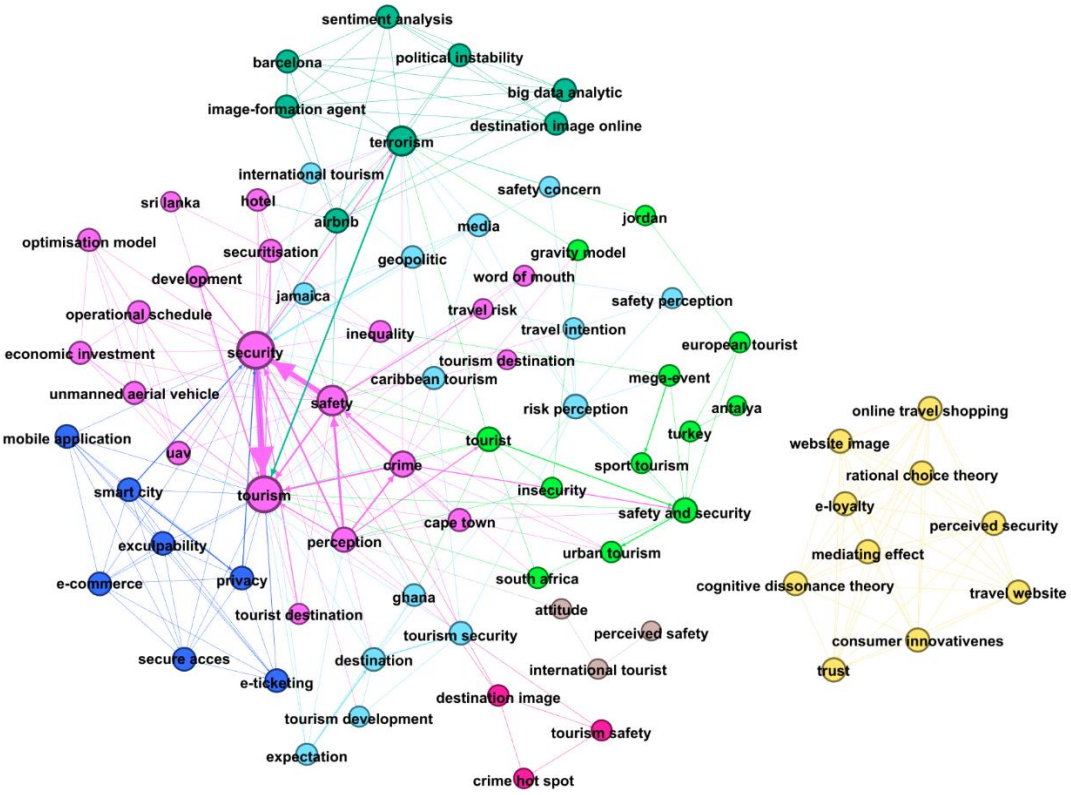
Figure 7. Top 15 keywords, cumulative frequency over time (after preprocessing)



Source: own elaboration

In the keyword network, all the words in Figure 8 have a degree of at least 7. The degree indicates the number of co-occurrences of author's keywords and different authors' keywords. The keyword 'security' has not only the highest frequency of occurrence but also the highest degree. The content of the keywords in each cluster shows the accuracy of the search strings in this study. The core words in each of the eight clusters are 'security', 'terrorism', 'tourism security', 'safety and security', 'tourism safety', 'perceived safety', 'perceived security', and 'smart city, privacy', respectively. The largest cluster, with 'security' as the core word, primarily relates to tourism security (e.g., security, tourism, safety, crime), and it includes 'Sri Lanka' and 'Cape Town'; it is worth noting that 'unmanned aerial vehicles' also appear in this cluster. The second major cluster, with 'terrorism' as the core word, contains keywords related to destination image, and it includes 'Barcelona'. The third major cluster, with 'tourism security' as the core word, relates to tourism development and includes 'Ghana'. The fourth major cluster, with 'safety and security' as the core word, is related to sports and tourism, and it includes 'Turkey'. The fifth major cluster has 'tourism safety' as its core word and includes 'crime hotspots'. The sixth major cluster has 'perceptions' as its core word and includes 'international tourists'. The seventh cluster has 'perceived security' as its core word and is related to loyalty; it includes 'mediating effect'. The eighth cluster has 'smart city' and 'privacy' as its two core words, and it includes 'e-ticketing'.

Figure 8. Keywords' network.



Note: Node size: degree (the number of other keywords it connects to); Node colour: modularity (cluster); Edge thickness: number of citations.

Source: own elaboration

3.3 Authors

Table 4 and Figure 9 show that George, R. is the author with the highest number of publications (4) and citations (308). However, in terms of H-index, the top spot goes to Hall, C.M., who has the fourth highest number of publications (2) and the second highest number of citations (282). Hall, C.M. was also the author with the highest number of normalised citations (199.4), while George, R. (154) ranked fifth. George, R.'s publication rank was significantly higher than or equal to his citation, normalised citation, and H-index rankings, which suggests that his research publications are more heterogeneous. By contrast, Hall, C.M.'s publication number is low, but his works have higher homogeneity. This shows that different authors make different choices in the balance of publication quantity and publication quality/variety.

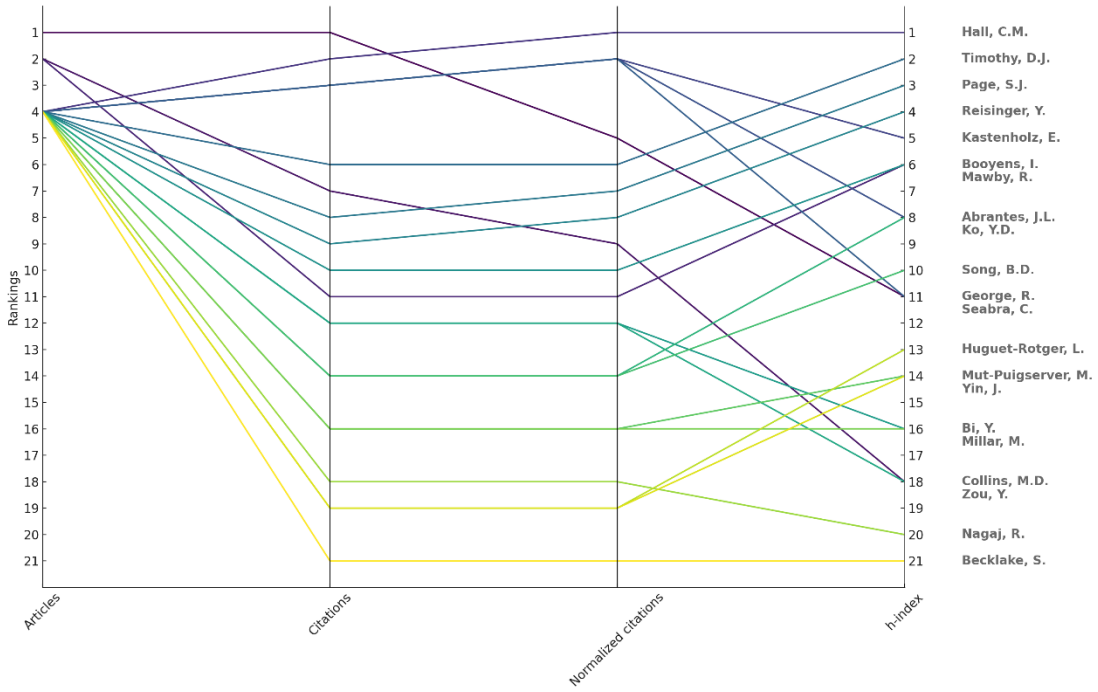
Table 4. Metrics rankings of authors with more than two published articles.

Author	Articles	Citations	Normalised citations	H-index
Hall, C.M.	2	282	199.40	84
Kastenholz, E.	2	263	185.97	34
Abrantes, J.L.	2	263	185.97	15
Seabra, C.	2	263	185.97	11
George, R.	4	308	154.00	11
Timothy, D.J.	2	206	145.66	47
Page, S.J.	2	62	43.84	44
Reisinger, Y.	2	61	43.13	35
Zou, Y.	3	73	42.15	6
Booyens, I.	2	58	41.01	17
Mawby, R.	3	46	26.56	17
Millar, M.	2	17	12.02	8
Collins, M.D.	2	17	12.02	6
Ko, Y.D.	2	16	11.31	15
Song, B.D.	2	16	11.31	14
Yin, J.	2	12	8.49	9
Bi, Y.	2	12	8.49	8
Nagaj, R.	2	7	4.95	5
Huguet-Rotger, L.	2	4	2.83	10
Mut-Puigserver, M.	2	4	2.83	9
Becklake, S.	2	3	2.12	2

Note: Normalised citations: The number of citations divided by the square root of the number of articles. Ordered by number of normalised citations.

Source: own elaboration

Figure 9. Parallel coordinate plot of metrics rankings of authors with more than two published articles.



Note: Ordered by articles published.

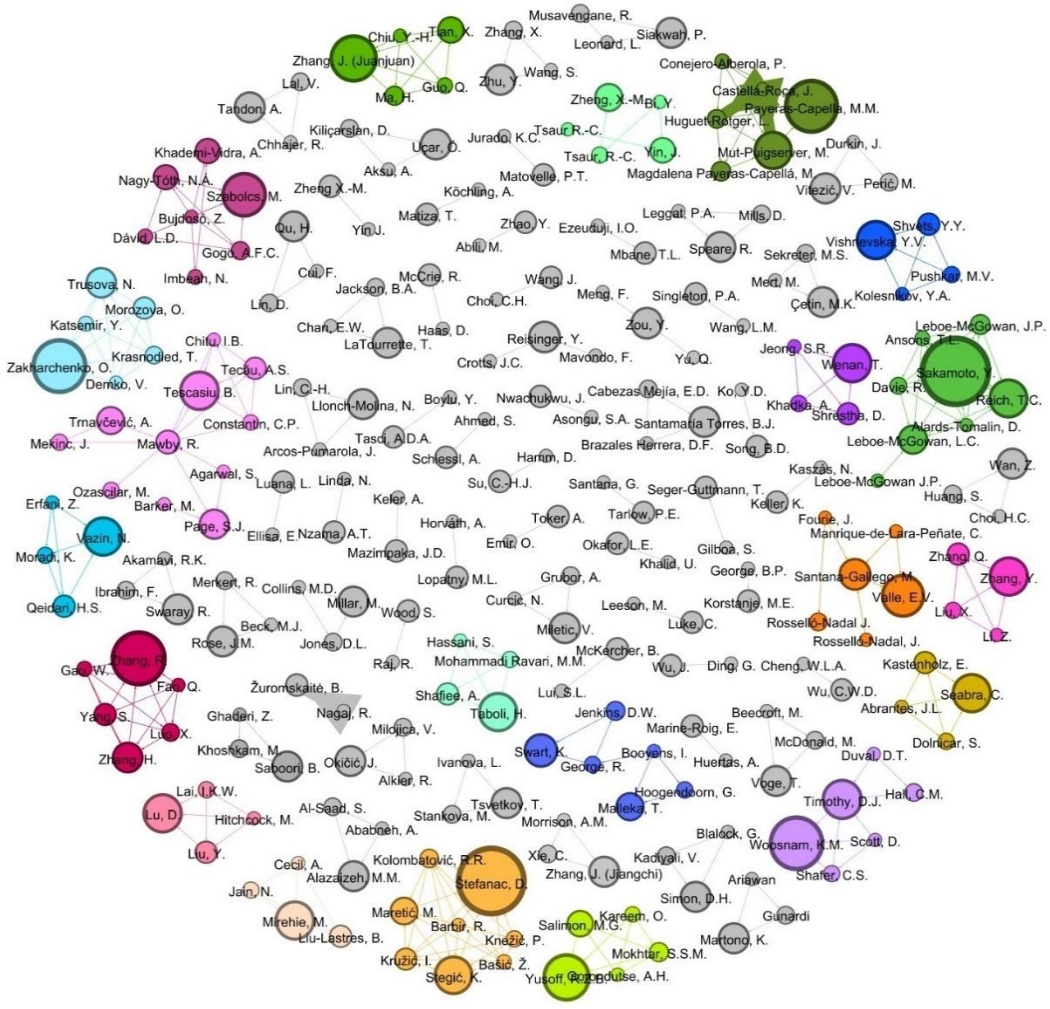
Source: own elaboration

In this study, authors with at least two articles in this field were used to form an author collaboration network (Figure 10). Each node in the graph represents one author, with 247 authors in total. The PageRank measure is presented in terms of the size of the nodes, and the thickness of the links between the nodes represents the total number of citations published by the authors in this field. The node sizes and the links between nodes represent the importance of the authors and their related authors in this field. Node colours are established by modularity. The high modularity (0.969) of this network indicates the presence of a large number of clusters in the network (77). In Figure 10, the grey clusters in the author network graph are the networks of authors who published only one paper with few citations. It should be noted that some authors are centrally located but do not collaborate with different clusters of authors.

Figure 10 and Table 5 show that Sakamoto, Y., Štefanac, D., Zakharchenko, O., Zhang, R., and Woosnam, K.M. are the core authors of the different clusters and are important authors in this field (according to PageRank measure). The largest author network consists of 11 authors, with Tescasiu, B. as the core. The networks led by Sakamoto, Y. and Štefanac, D. contain 8 authors each and are in second place. It is worth noting that Mawby, R. has the highest degree (9), closeness centrality (1), and betweenness centrality (13), but not the highest PageRank (0.004445),

and his H-index is 17; this shows that Mawby, R. is not only an active and influential scholar in this research field, but also an important bridge between different research groups. It can be concluded that the research in this field needs more collaboration among authors with high PageRanks to improve the research quality.

Figure 10. Authors collaboration network.



Note: Node size: PageRank centrality; Node colour: modularity class (community); Edge thickness: number of citations.

Source: own elaboration

Table 5. Top 20 authors'network centrality measures (importance).

Authors	Degree	PageRank	Closeness Centrality	Betweenness Centrality
Sakamoto, Y.	6	0.013937	0	0
Štefanac, D.	7	0.013787	0	0
Zakharchenko, O.	5	0.010769	0	0
Zhang, R.	5	0.010769	0	0
Woosnam, K.M.	3	0.010712	0	0
Payeras-Capella, M.M.	4	0.010585	0	0
Zhang, J. (Juanjuan)	4	0.009204	0	0
Yusoff, R.Z.B.	4	0.009204	0	0
Szabolcs, M.	4	0.008666	0	0
Valle, E.V.	2	0.008346	0	0
Timothy, D.J.	5	0.007775	1	2
Tescasiu, B.	4	0.007624	0	0
Mirehie, M.	3	0.007591	0	0
Seabra, C.	3	0.007591	0	0
Lu, D.	3	0.007591	0	0
Zhang, Y.	3	0.007591	0	0
Wenan, T.	3	0.007591	0	0
Vishnevska, Y.V.	3	0.007591	0	0
Vazin, N.	3	0.007591	0	0
Taboli, H.	3	0.007591	0	0

Note: Ordered by PageRank.

Source: own elaboration

3.4 Location

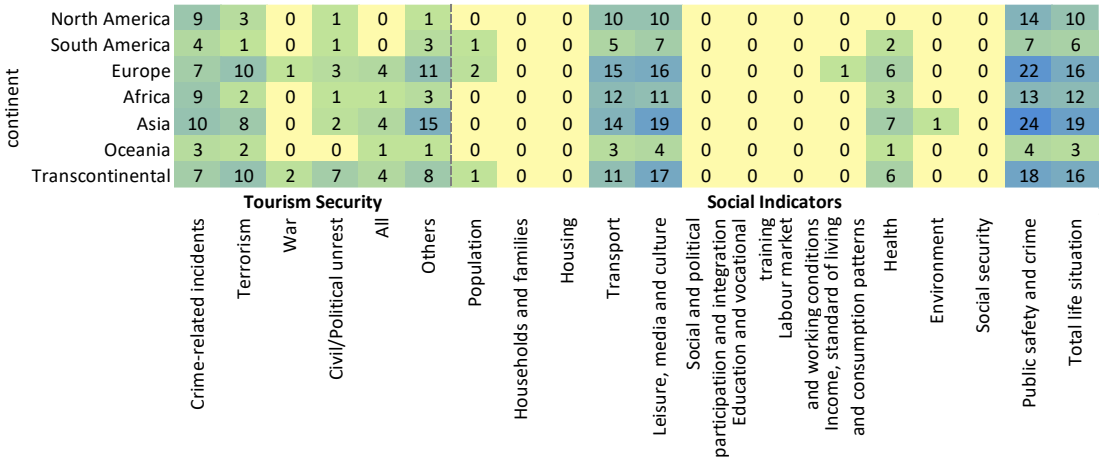
Figure 11 shows the country collaboration network in this field. The collaborating countries and their corresponding number of publications are as follows: China and South Korea (3), China and Taiwan (3), the United Kingdom and South Africa (2), Poland and Lithuania (2), and all remaining collaborating countries (1). The United Kingdom collaborated with the most countries (8), followed by the United States (6), South Africa (5), and China (5). There are geographical ties between Poland and Lithuania, as well as among China, Taiwan, and South Korea, and the results of such collaborative studies are more conducive to the development of tourism in the respective region. In addition, in the collaborative studies between South Africa and other countries, the primary focus was on terrorist attacks, while the secondary focus was on crime. South Africa experienced a total of 179 terrorist attacks over the ten-year period 2011–2020, which is of greater concern to the academic community than the country's high crime rate.

Figure 11. Country collaboration network.

Source: own elaboration

Figure 12 shows the focus of tourism security research by continent for the different sample topics. Of the 122 articles examined, 12 could not be confirmed, 1 was a literature review, and 1 was a model test; after these were omitted, a total of 108 articles were examined. Asia (10), North America (9), and Africa (9) are the key regions for crime research. Transcontinental (10), Europe (10), and Asia (8) are the key regions for terrorism research, with relatively fewer war-related studies. Transcontinental (7) and Europe (3) are the key regions for civil and political unrest research. In terms of social indicators, Europe (15), Asia (14), Transcontinental (11), and North America (10) focus on transport risks; Asia (19), Transcontinental (17), Europe (16), and North America (10) focus on tourist leisure, media and culture; Asia (24), Europe (22), Transcontinental (18), and North America (14) focus on tourists' public safety and crime; and Asia (19), Europe (16), Transcontinental (16), and North America (10) focus on tourists' total life situation. In addition, tourists' public safety was ranked as a top priority in all regional studies, followed by total life situation and issues related to leisure, media and culture.

Figure 12. Distribution of study sample topics



Source: own elaboration

3.5 Text mining

Figure 13 shows the most common bigrams (two words in adjacent series) and trigrams (three words in adjacent series) in titles and abstracts. Among these, safety security (in 25 articles) and tourism industry (in 24 articles) are the most frequent bigrams and trigrams, followed by tourism security (in 14 articles), security tourism (in 13 articles), tourist destinations (in 13 articles), and perceptions safety (in 13 articles). It is worth noting that Cape Town is the most frequent location (mentioned in 6 articles).

In terms of methodology, many authors applied content analysis as their primary data analysis method (in 5 articles).

Figure 13. Top 100 frequent bigrams and trigrams in the titles and abstracts.

Source: own elaboration

The LDA coherence result for 2–10 topics shows that the best number of topics is 3, with a value of 0.347 (Figure 14). We named topic 1 “Management”, as it includes tourism services and tourism management systems. Topic 2 centred on “Perception and Risk Assessment”, which included destination image and risk perception. Topic 3 focused on “Development”, which is related to tourism and international tourist flows. Table 6 contains the titles and authors of the studies on each of the above topics.

Figure 14. LDA 3 topics, top 10 terms per topic.

Source: own elaboration

Table 6. Article examples per topic.

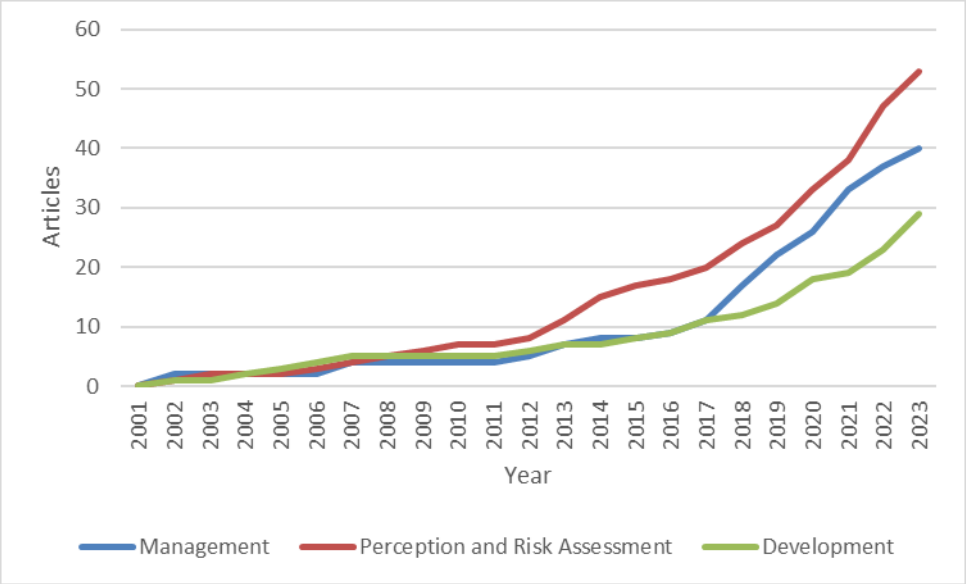
Topic	Title	Author (s), Year
Management	The impact of security scanners at airports and ethnic minority travellers' experience	(Wood & Raj, 2021)
	Safety Forecasting and Early Warning of Highly Aggregated Tourist Crowds in China	(Yin et al., 2019)
	Complementary Cooperation of CCTV and UAV Systems for Tourism Security and Sustainability	(Ko & Song, 2021a)
Perception and risk Assessment	Perceived Safety and some Other Factors in Tourist’s Decision-Making Process: Findings from Opatija Riviera	(Alkier et al., 2023)
	Safety, security and peace tourism: The case of the DMZ area	(Shin, 2005)
	Tourists’ Perceptions of London, United Kingdom (UK), as a Safe Host City During the 2012 Olympic Games	(George, 2015)
Development	Touristic security: not a ‘win-win’ global security practice	(Becklake, 2023)
	Regaining international tourism attractiveness after an armed conflict: the role of security spending	(Okafor & Khalid, 2021)
	The securitisation of Sri Lankan tourism in the absence of peace	(Hyndman, 2015)

Source: own elaboration

As can be seen in Figure 15, there was no significant difference in the number of publications for each of the three themes before 2012, and the difference in number of publications across the different topics began to stabilise after 2018. Of these, ‘perception and risk assessment’ ranks

highest. It is worth noting that the COVID-19 pandemic broke out in 2020, severely hitting the global tourism industry, which may be the driving force for the three topics in this field to continue to receive attention and show a stable growth trend.

Figure 15. Annual publication trends for the three topics.

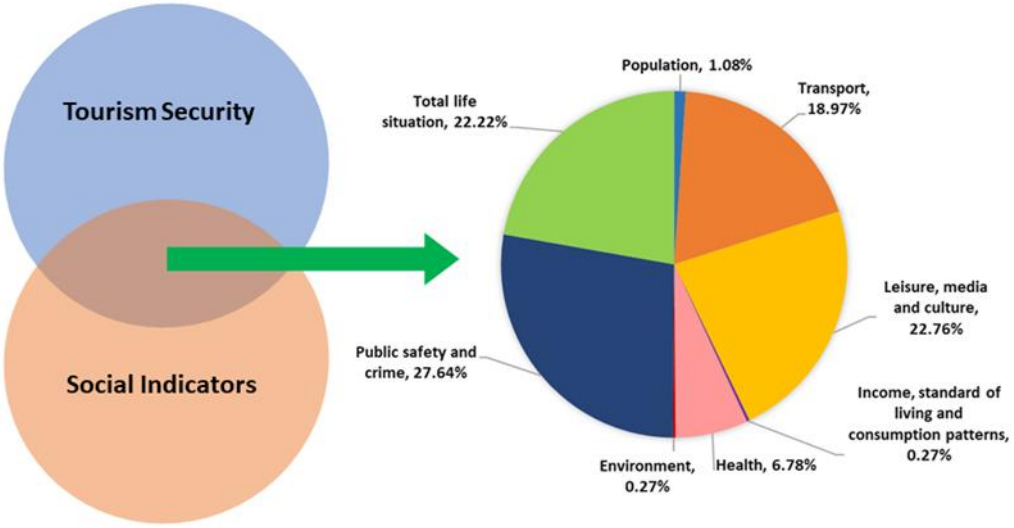


Source: own elaboration

3.6 Relationship between tourism security and social indicators

This study examined the contents of 122 articles, excluding those which could neither be categorised from the abstracts nor be downloaded. In total, 108 articles were examined and classified according to the categories of tourism security and social indicators. The results show that public safety and crime (27.64%), leisure, media and culture (22.76%), total life situation (22.22%), and transport (18.97%) were the social indicators which received the most attention in tourism security research, accounting for 91.57% of the total, and all of these topics have increased annually since 2018 (Figure 16).

Figure 16. Categorisation of the research of tourism security by type of social indicator (percentages).



Source: own elaboration

Unsurprisingly, crime and terrorism remain the primary focal points in research on tourism security. When travelling, tourists leaving their familiar living areas and entering unfamiliar environments are prone to insecurity, the extent of which is highly related to the quality of tourism security at the destination (Guan et al., 2022). These aspects are related to tourists' daily habits and have naturally received attention from the academic community (Table 7).

In terms of crime, tourists' experience, perception, and fear of criminal events on their mode of transport can change their travel behaviour (e.g., changing their mode of transport, changing their travel time, or even not travelling, Heinen, 2023). In addition, when assessing public safety, previous studies have considered the number of offences against traffic safety and transport operations, the number of offences against public safety, order and morality, and the number of offences against property to be indicators (Moisyeyeva and Didenko, 2018; Sazonets and Stoian, 2013; Trusova et al., 2022), and they have shown a strong link between crime and public safety. Crime has a significant impact on people's lives: high crime rates are one of the obstacles to economic development, as it causes anxiety, disrupts the social order, and affects the willingness of investors to invest, which in turn causes new problems in the economic and social spheres (Motta, 2017). In particular, economically motivated crime makes it difficult for a regional economy to develop (Li et al., 2019; Zet, 2022), which in turn affects the quality of life of the local population.

In terms of terrorist attacks, research by Tin et al. (2022) shows that 27.8% of transport-related (air, sea, and ground) terrorist attacks occurred in South Asia, 18.2% occurred in the Middle East

and North Africa, and 14.7% occurred in South America, accounting for 60.7% of all transport-related attacks. Transport-related terrorist attacks caused 19,020 deaths and 45,218 injuries worldwide, accounting for 5.2% of all terrorist-attack events, 5.6% of deaths, and 9.1% of injuries. Transport modes are easy targets for terrorist attacks, and compared to other modes of transport, metros face a unique, significantly higher casualty risk with regard to suicide attacks (Tin et al., 2022). Metros are an indispensable mode of transport for urban tourists, and so they are naturally a focus of the research on tourism security. Regarding another social indicator, gross domestic product (GDP) per capita is often used to represent the quality of life of individuals living in various countries (Becker et al., 2005), and terrorism has been shown to have an adverse effect on GDP (Paul & Bagchi, 2023). The negative impact of terrorism on macroeconomic aggregates—primarily through trade disruptions, reduced foreign investment, and the removal of neighbouring countries' incentives for entry and exit (Khelifi et al., 2023)—implies that terrorist attacks have a significant impact on the quality of life of the local population. Finally, tourism is a common leisure activity, which also makes tourists a target for lone-wolf terrorists. In addition, lack of communication about the risk of terrorism, poor policing, and limited integration of counter-terrorism strategies (especially inadequate implementation of environmental mitigation measures) not only limit tourism activities but also change tourists' travelling decisions (changing their destination or date, or even not travelling) (Agarwal et al., 2021).

The impact of war on social indicators is comprehensive. For example, in the Russian-Ukrainian War, the result of mutual economic sanctions between the two camps caused oil, gas, utilities, and food prices to skyrocket a few days after the crisis, and global inflation is steadily rising due to the reduction in investment and the impediments to economic growth caused by political risk (Mbah & Wasum, 2022). This does not even include the destruction of infrastructure in the war zone, which cannot be recovered in the short term. Research by Zhang et al. (2022) shows that the spillover effects of partisan conflicts and uncertainty over national security policy have a greater impact on the tourism industry than all other industries. These two situations increase tourists' travel fear, thus reducing the number of days tourists are present and the tourist flow. In addition, the spillover effects of geopolitical instability in the regions neighbouring tourist destinations can have a significant and far-reaching impact on the tourism industry when it is reported in international media (Boulassel, 2020).

Table 7. Categorisation of the research of tourism security by type of social indicator (by year).

Year	Tourism Security						Social Indicators							
	Crime-related incidents	Terrorism	War	Civil/Political unrest	All	Others	Population	Transport	Leisure, media and culture	Income, standard of living and consumption	Health	Environment	Public safety and crime	Total life situation
2023	2	4	2	4	4	2	1	5	7	1	5	0	11	11
2022	9	3	0	5	3	7	0	13	9	0	5	0	14	10
2021	5	5	0	1	2	7	2	7	8	0	5	0	11	9
2020	7	4	0	2	2	6	0	8	12	0	3	1	13	13
2019	4	3	0	0	0	4	0	6	7	0	1	0	9	5
2018	4	4	0	0	0	3	0	5	8	0	0	0	7	5
2017	2	1	0	0	2	3	0	3	4	0	2	0	5	5
2016	2	1	0	0	0	0	0	1	3	0	0	0	3	2
2015	2	1	0	1	0	0	0	1	3	0	0	0	3	2
2014	2	1	0	0	0	1	0	4	3	0	0	0	4	2
2013	0	2	0	1	0	4	1	3	5	0	1	0	6	5
2012	2	1	0	0	0	1	0	3	2	0	1	0	3	2
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	1	0	0	0	0	1	0	1	1	0	1	0	1	1
2009	0	0	0	0	1	1	0	1	1	0	1	0	1	1
2008	1	0	0	0	0	0	0	1	1	0	0	0	1	1
2007	2	3	0	0	0	1	0	3	3	0	0	0	4	3
2006	1	2	1	1	0	0	0	2	2	0	0	0	2	2
2005	0	1	1	1	0	0	0	1	1	0	0	0	1	1
2004	0	0	0	0	1	1	0	1	1	0	1	0	1	1
2003	1	0	0	0	0	0	0	1	1	0	0	0	1	1
2002	2	2	0	0	0	0	0	3	4	0	0	0	4	2
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: No data are available for Households and families, Housing, Social and political participation and integration, Education and vocational training, Labour market and working conditions, and Social security; therefore they are not included in the table.

Source: own elaboration

4 Discussion

Based on the findings of the aforementioned sections, this study has selected significant, divergent research results for discussion and offers the following recommendations to governments and tourism stakeholders.

Firstly, in terms of tourism security thinking, current research, dominated by a 'White Western' perspective, has occasionally led to less security outcomes for certain destinations (Becklake, 2023). This study suggests that governments or private operators should base their tourism security improvement strategies on local research findings to genuinely aid destination development.

Secondly, concerning the development of destination security, Ghaderi et al. (2017) highlighted different tasks for developed and developing countries; Kumail et al. (2021) identified poverty eradication as a primary method to enhance destination security. This study recommends that governments in developed countries should comprehensively review and rectify existing practices in maintaining destination security, whereas governments in developing countries should invest in

infrastructure to improve living standards and alleviate concerns about destination security. Moreover, the private sector (especially tourism stakehodlers) must robustly monitor governmental actions to maintain an incorrupt government and actively participate in policy formulation for sustainable tourism.

Thirdly, in terms of improving destination security measures, Ko & Song (2021a) emphasised the application of new technology, while Asongu & Nwachukwu (2019) focused on effective human resource utilisation. This study suggests employing unmanned aerial vehicles (UAVs) in conjunction with closed-circuit television (CCTV) for crime prevention and reconnaissance by police and security personnel, and, where necessary, using armed forces to combat crime (especially terrorism). Additionally, planning 'soft' (such as security slogans and broadcasting systems, surveillance systems) and 'hard' (such as security checks and fixed patrols) security facilities based on the characteristics of destination visitors can prevent wastage and effectively improve destination security.

Fourthly, in terms of destination security management, Yin et al. (2019) considered crowd management and avoiding overtourism crucial, while Alkier et al. (2023) focused on the maintenance of destination security facilities. This study advises that destination management bodies should establish and seriously implement medium- and long-term inspection and maintenance procedures for security -related facilities (especially entertainment and consumer facilities and equipment) to maintain their security and functionality. Furthermore, strategies for assessing and managing crowd sizes during peak tourist seasons should be devised in advance and strictly enforced to maintain tourism quality and reduce risks.

Fifthly, in maintaining the safety image of destinations, Malleka et al. (2022) emphasised the improvement of destination security stereotypes; Kumail et al. (2021) believed that cooperation between the government, media, and tourism stakeholders could yield the greatest results. This study suggests that for stigmatised destinations, governments should strengthen crime prevention and combat efforts, while tourism stakeholders should cooperate with the media to enhance marketing of the destination and promptly address negative misinformation to improve the destination image. Additionally, tourism stakeholders should also collaborate with governmental bodies to maintain destination security and ensure strict penalties and patrols to reduce crime rates. Finally, the media must also play a significant role by providing visitors with relevant security information to enhance their awareness and vigilance.

Lastly, regarding the link between tourism security and social indicators, previous research showed that tourists experience greater crime fears in pedestrian zones or during large gatherings (Deka et al., 2018; Seabra, 2024) than on public transport (Lee et al., 2024; Soto et al., 2022), especially in areas that have experienced terrorist attacks, political or geopolitical conflicts, or prolonged wars (Dávid et al., 2007). Therefore, this study recommends that governments should focus on maintaining safety in key areas (high-risk public transport hubs, pedestrian zones, and large crowd gathering places) by increasing police foot patrols, establishing community guard teams, and integrating modern technology (such as Artificial Intelligence security facilities) for crowd monitoring to reduce crime rates. Furthermore, the electorate must use their vote to elect an efficient and incorrupt government and fulfil their duty of oversight as the fundamental means to improve social indicators and thereby enhance destination tourism security. Additionally, reducing regional conflicts, class opposition, racial discrimination, and religious exclusion will help in managing a country's tourism risks and establishing a security image. Although there are different types of human-made risks to tourism security, there may be correlations between different risks, such as between political instability and crime or between civil unrest and crime. Similarly, there are correlations between different social indicators (for example, public safety and transportation affect the total life situation). Research on the relationships between these two system networks will aid in the assessment of society and quality of life in different regions, as well as the impact on (temporary) residents.

5 Conclusions

This study analyses the literature on tourism security in the twenty-first century (2001–2023) in relation to social indicators using different research methodologies. Visualising the data and analysing the data in different networks can help to elucidate the literature on tourism security.

Surprisingly, the articles with high normalised citations are dominated by regular articles, which greatly outnumber open-access articles. Articles addressing destination security perceptions and online travel reviews have the highest normalised citations and are the current focus of research topics and methodologies in this field.

Most of the articles with high normalised citations appeared in the last few years (2017–2023), indicating that research in this field is gradually becoming more important but is nevertheless beginning to reach a point of maturity.

The 21st-century research literature in this field was divided into eight clusters (based on author keywords) and three topics (based on titles and abstracts). The three topics—management, risk perception and assessment, and development—began to grow substantially after 2018, with 'risk perception and assessment' increasing at the fastest rate. This increase may indicate that subjective risk perceptions and assessments of tourism security have begun to replace perceptions from tourism stakeholders in terms of academic importance.

Geographically, with the United Kingdom hosting the most cross-border co-operation studies, followed by the United States, with China coming third. The most obvious place for regional co-operation is in Asia, and Asian countries hoping to gain a foothold among the major European and American tourism countries can do so in this way. In addition to tourist flows and the sustainable operation of the local tourism industry, social indicator items which affect tourists' daily life have become the focus of tourism security scholars.

The findings of this study can provide an overview of the research trends and latest developments in the field in the twenty-first century. In addition to adding to the knowledge base of the field, this study also benefits tourism stakeholders: if they understand the subjective needs of tourists with regard to tourism security, not only can current shortcomings in tourism security be improved but also risk response and prevention measures can be further adapted to the actual situation to reduce the harm caused to tourists by tourism security risks. In addition, the findings of related studies on social indicators can help in the overall planning of the country: attaching importance to the quality of social indicators for residents, understanding the priorities of different items in terms of improvement, and focusing manpower and resources on improving the efficiency of quality enhancement are all conducive to the development of tourist destinations. Finally, for regions where co-operation research is currently insufficient, the findings can support future thinking on the choice of co-operation partners and knowledge exchange.

Future research may include topics related to natural disasters and health-related tourism security issues, exploring their connections with social indicators. Additionally, the terminology and definitions of tourism safety and security should be unified to facilitate academic communication. Lastly, given the profound links between social indicators and tourism security, which can serve

as valuable references for government policymaking, this should be prioritised as a key objective for future studies.

This study has some research limitations. First, natural disaster, and health-related tourism safety were not included. Second, in the authors' keyword section, some authors presented only abbreviations, which will result in variations in the results for word frequency analysis and the keyword network. Although we conducted keyword merging in this area, there are still leakages, and further improvement measures may be required. Finally, the categorisation of target articles according to tourism security and social indicators is relatively subjective, which may lead to bias in categorisation.

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