Original Article

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Quantitative analysis of data relating to ski tourism according to Scorpus database

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Abstract

Background: The aim of the research was to acquire knowledge as to how the development of scientific publications looks, while also to specify the scope of research on the area of ski tourism. The research process is concentrated on the following research questions: In what way has the scientific output developed in the field of research on ski tourism? Who is the principal participant (countries, universities, authors, titles of sources) in the accumulation of research in a particular field? *Method:* In the process of selecting the test sample as a source of bibliometric data the Scopus database was applied. The test sample (N=1500) consisted of publications that contained such phrases in their works as "ski tourism", "ski hotels", "ski resorts" in their titles or key words. A general profiling of publications was conducted in order to assess the trends in scientific output and the acknowledgement of the leading co-workers in the field of research. MS Excel was applied for the purpose of supporting the process of analysis and the visualization of results. *Results:* The analysis indicates that research on ski tourism is one of the aspects of great tradition. This has gained increasingly great interest among academic environments, which led to the breakthrough growth in the number of publications in 2006 indexed in the Scopus database. This publication output encompasses 26 research areas. *Conclusions:* The principal areas yielding the largest number of publications with regard to ski tourism are to be found in social sciences and science on the environment. The main authors and co-authors in this field are as follows: representatives from the EU and the USA, while the most productive research institution is Universität Innsbruck. The author of the greatest number of publications is Prof. Daniel Scott (University of Waterloo, Canada). The EU is one of the main sponsors.

Keywords: ski tourism, bibliometrics, research profiling, analysis of literature, physical activity.

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INTRODUCTION

Winter tourism has been dominated, both in terms of marketing as well as scientific publications, by almost the sole focus on winter sports, particularly skiing [1]. Likewise, the ski tourism associated with this is one of the most popular winter activities worldwide [2,3]. In this case, we are referring to such categories of activities that are associated with the possibilities of satisfying a multitude of various needs, including biological and psycho-social needs [4,5]. With relation to this variety, basing on one definition of the tourist product would not be justified in this case [2,6–8]. Ski tourism may be viewed as universal physical activity combined with the experiencing of impressions or social situations associated with the execution of the preferred activities in the open air while having contact with nature. In the scope of this notion, we may also find, among other things, the concept of psychological analysis regarding the tourist product. In accordance with this concept, the tourist product is acknowledged to be an integrated structure of expectations, benefits and impressions that create the composition of three types of trips: imagined, actual and remembered [9].

Ski tourism, particularly when practiced regularly, may lead to healthy aging by means of a healthy lifestyle and a higher level of physical activity [2]. In subject-related literature, data is indicated that is associated with the beneficial health effects of downhill skiing as a response to the specific challenges and adaptation of the muscle-skeleton structures and control of posture to the exposure to low temperatures and temporary hypoxia, while also emotional and social benefits accruing from recreation in the open air [10]. Regular physical activity and satisfaction from the social contacts, that accompany this sporting activity, were analysed as significant positive predictors. That go together with the execution of a summary equilibrium test among senior citizens, both male and female [11]. The organized physical activity, including sport, is a phenomenon that encompasses both physical and social spheres [12]. The readiness to engage in tourism that is associated with the possibility of intensive movement leads to overcoming the vicious circle of the causes and effects existing in the following: insufficient movement, the lack of confidence in terms of movement, while also a worsening condition and secondary insufficient movement [13]. Research indicates that skiing may lead to the achievement of the commonly accepted threshold of minimum recommendations relating to the level of physical activity per week [14]. The literature available also shows the role of the engagement of people of varying ages in ski tourism in order to enhance the overall psycho-physical well-being [15–17]**.** These results correspond with the research findings relating to other areas of physical activity of proven usefulness for the health and psycho-physical functioning [18–22].

Analysis of literature devoted to ski tourism illustrates that the stimuli associated with skiing may be intensive enough in order to generate beneficial adaptation for both sex types and a broad age span. The existing data also indicates the possibility of gaining emotional and social benefits accruing from this type of recreation in the open air [5,9]. The research findings illustrate the slower aging process by means of connecting skiing and ski tourism with a healthy lifestyle, while also a higher level of physical activity. The premises have been indicated which may ascertain to the fact that ski tourism may result in better cognitive efficiency or increased psycho-physical reactivity and regeneration in people aged over sixty. However, there is still insufficient evidence to confirm this theory [23].

It would seem that research is still required in order to gain more knowledge on the subject of ski tourism. More data is required in order to prepare, among other things, a strategy of public health that could prolong the health and quality of life for people of all ages.

The question arises here as to what the access to specialized literature relating to ski tourism is ? Are there many works on this subject that could be recommended to others ? This is why the aim of this paper is to acquire knowledge on the development of scientific output and the specification in the area of scope on the subject of ski tourism researches. The research process concentrates on the following research questions:

1. In what way has the scientific output developed in the field of research on ski tourism ?
2. Who is the main participant (countries, universities, authors, titles of sources) in terms of accumulating the research in a given field ?

MATERIAL AND METHOD

In the process of selecting the test sample the Scopus database was applied as the source of bibliometric data. The test sample (N=1500) consisted of publications which contained such phrases in their works as "ski tourism", "ski hotels", "ski resorts" in the titles or key words. A general profiling of the publications was conducted in order to assess the trends in scientific output and acknowledgement of the leading co-workers in this field of research. MS Excel was applied in order to support the process of analysis and visualization of the results of the software used.

Algorithms used: (TITLE-ABS-KEY (ski AND tourism) OR TITLE-ABS-KEY (ski AND hotels) OR TITLE-ABS-KEY (ski AND resorts)).

A general profiling of the publications was conducted in order to assess the trends in scientific output and acknowledgement of the leading co-workers in this field of research. MS Excel was applied in order to support the process of analysis and visualization of the results of the software used.

RESULTS

The results of the search according to the assumed algorithm illustrate 1500 entries in Scopus. According to Fig.1, it is visible that the number of papers relating to the subject of physical activity of older people is rising. In Fig.2, the number of papers per person with regard to countries has been presented. The greatest level of interest in this subject among authors is in the USA (163 papers), while subsequently Canada (63 papers) and Spain (23 papers). In Table 1, a set of bibliometric data has been illustrated which specifies the highest number of publications divided into the following: Document Type, Subject Area, Documents by funding sponsor, Affiliation, Author Name, Journals.

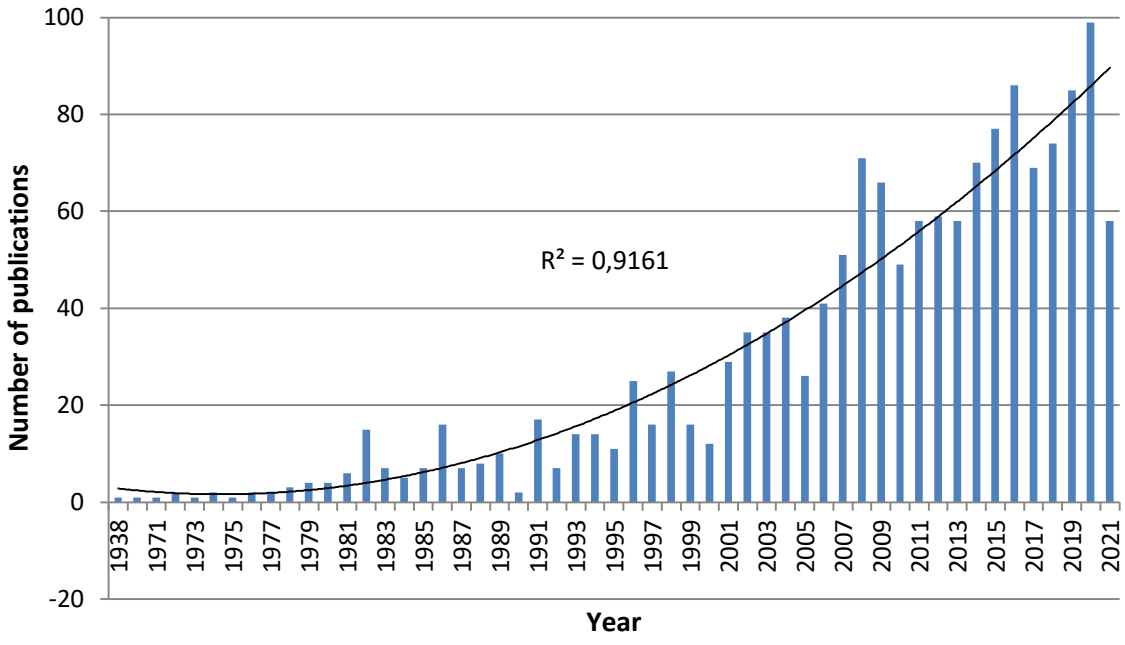

Figure 1. Number of scientific papers relating to ski tourism in the subsequent years.

Table 1. Chosen bibliometric data from test sample.

Category	Number of publications
Document Type	Article (1135); Conference Paper (198); Review (57); Book Chapter (55); Book (15); Short Survey (11); Note (10); Conference Review (7); Editorial (4); Letter (4); Erratum (2); Abstract Report (1); Business Article (1)
Subject Area	Social Sciences (447); Environmental Science (431); Business, Management and Accounting (333); Earth and Planetary Sciences (333); Medicine (226); Engineering (169); Agricultural and Biological Sciences (145); Computer Science (90); Energy (66); Materials Science (65); Health Professions (55); Arts and Humanities (45); Economics, Econometrics and Finance (44); Decision Sciences (29); Mathematics (25); Biochemistry, Genetics and Molecular Biology (24); Physics and Astronomy (19); Psychology (18); Multidisciplinary (12); Immunology and Microbiology (9); Chemistry (8); Chemical Engineering (7); Pharmacology, Toxicology and Pharmaceutics (5); Neuroscience (4); Nursing (3); Veterinary (1)
Documents by funding sponsor (top 20 items)	European Commission (28); Government of Canada (12); European Regional Development Fund (11); National Institutes of Health (10); U.S. Department of Health and Human Services (10); Horizon 2020 Framework Programme (9); Social Sciences and Humanities Research Council of Canada (9); National Cancer Institute (8); National Natural Science Foundation of China (8); Ministerio de Economía y Competitividad (6); National Science Foundation (6); Agentúra na Podporu Výskumu a Vývoja (5); Seventh Framework Programme (5); Ministerio de Economía, Industria y Competitividad, Gobierno de España (4); Ministerstvo školstva, vedy, výskumu a športu Slovenskej republiky (4); Russian Foundation for Basic Research (4); Schweizerischer Nationalfonds zur Förderung der Wissenschaftlichen Forschung (4); Svenska Forskningsrådet Formas (4); U.S. Department of Agriculture (4); Vedecká Grantová Agentúra (4)
Affiliation (top 21 items)	Universität Innsbruck (52); Universite Grenoble Alpes (38); INRAE (36); University of Waterloo (27); CNRS Centre National de la Recherche Scientifique (22); WSL - Institut für Schnee- und Lawinenforschung SLF - Davos (20); Université Savoie Mont Blanc (18); Météo France (18); Università degli Studi di Torino (17); University of Zurich (17); Universitat de Barcelona (16); Osterreichisches Institut fur Wirtschaftsforschung (16); University of Belgrade (15); Laboratoire des Écosystèmes et des Sociétés en Montagne (15); Instituto Pirenaico de Ecología (14); Griffith University (14); Martina Hansens Hospital (14); Consejo Superior de Investigaciones Científicas (13); Inland Norway University of Applied Sciences (13); Universidad de Granada (12); University of Colorado Anschutz Medical Campus (12)
Author Name (top 22 items)	Scott, D. (25); Steiger, R. (23); Ekeland, A. (17); Falk, M. (16); François, H. (16); Morin, S. (15); Malasevska, I. (12); Pons, M. (12); Andersen, P.A. (10); Haugom, E. (10); Rødven, A. (10); Buller, D.B. (9); Demiroglu, O.C. (9); Spandre, P. (9); Abegg, B. (8); Cutter, G.R. (8); Johnson, R.J. (8); Lafaysse, M. (8); Laporte, J.D. (8); Scott, M.D. (8); Shealy, J.E. (8); Walkosz, B.J. (8)
Journals (top 20 items)	Tourism Management (28); Revue De Geographie Alpine (26); Cold Regions Science And Technology (17); Sustainability Switzerland (17); American Journal Of Sports Medicine (15); Journal Of ASTM International (15); Journal Of Sustainable Tourism (15); Journal Of Outdoor Recreation And Tourism (14); Scandinavian Journal Of Hospitality And Tourism (14); Tourism Economics (14); Journal Of Travel And Tourism Marketing (13); Journal Of Travel Research (13); Tourism Review (13); Annals Of Glaciology (11); Current Issues In Tourism (11); Mountain Research And Development (11); Wilderness And Environmental Medicine (11); Journal Of Sport And Tourism (10); Journal Of Vacation Marketing (8); Mediterranean (8)

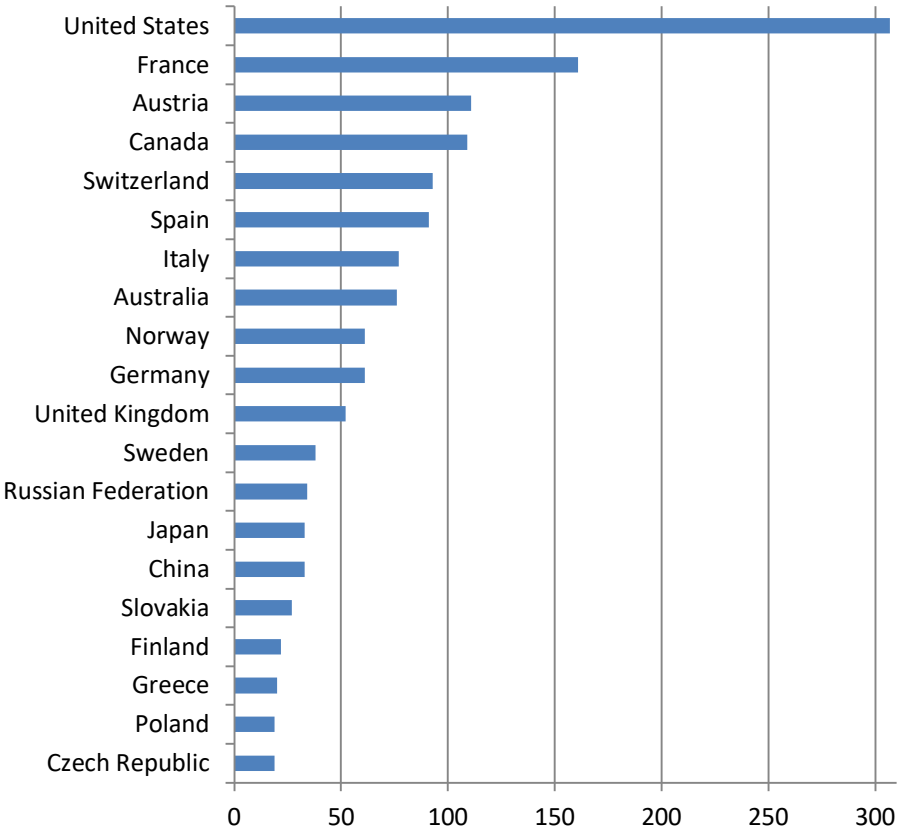

Figure 2. Number of papers per person with regard to countries (the first 20 countries).

DISCUSSION

The set presented facilitates the conclusion that researchers mainly analyse the impact of the economic, climatic, environmental conditions on infrastructure and on an individual. This is entered into the area of the notion of the strategies of public health [24,25]. The analysed publications indicate that ski tourism may lead to healthy aging and a higher standard of living [25–27]. However, attention is paid to the occurrence of injuries and comments that skiing resorts and the skiing industry itself should concentrate on designing infrastructure in order to minimize the risk of serious injury [29,30].

The analysis conducted illustrates that the number of papers on the subject of ski tourism is growing (Figure 1). Initially, in the years 1938-1980 it was not a very popular subject. Only from 1996 was the growth trend observed in which the number of papers exceeded 20 publications within the year. Although the years 1982, 1986, 1991 witnessed a clear growth in the number of indexed research analysis, the breakthrough growth in the number of publications was observed from 2006, in which there was an increase of over 40 papers during the year, while later the numbers were only higher.

It is possible to observe that the greatest interest in this subject matter is among the authors of the USA (21.3 %), who are the unquestioned leader among the countries analysed. Authors from France (11.1 %) publish almost twice less, while scientists from Austria, Canada, Switzerland and Spain at the level of 6-7 % , holding positions of 3-6 in this ranking (Figure 2). However, if we examine this carefully, it is possible to notice that the majority of works are derived from the EU zone (49 %). The authors of the greatest numbers of publications are the representatives of Canada and Austria, Prof. Daniel Scott (University of Waterloo) and Prof. Steiger Robert (Universität Innsbruck) respectively (Table 1).

The majority of the papers are original and constitute 75.7% of all the publications on this subject matter. The principal areas of focus for the greatest number of publications are to be found in

the field of social sciences (448 papers) science on the environment (432 papers), science on business, management and accounting (334 papers), while also science on the Earth and planetary world (334 papers), giving a combined total of as many as 59.2 % of all the subject areas. The entire scientific output encompasses 26 research areas.

The following universities and research institutions are seen to be the leading ones in this field: Universität Innsbruck; Universite Grenoble Alpes; INRAE; University of Waterloo; CNRS Centre National de la Recherche Scientifique; WSL - Institut für Schnee- und Lawinenforschung SLF - Davos. The EU is one of the main sponsors in terms of this research. The key magazines on the subject matter of ski tourism according to Scopus are as follows:
Tourism Management; Revue De Geographie Alpine.

The limitation of this research related to the analysis of only one bibliometric database and its restriction to the English language alone. Unfortunately, in the bibliometrics is a lack of standardization of the possibilities of the accumulation and indexation criteria [31]. It would be interesting to repeat the research with bibliometric data taken from other databases, including records in other languages than the English language. In the future, together with the development of the search engine and the possibilities of artificial intelligence as a translator, it will be possible to conduct such an analysis with the aid of more sophisticated calculation methods on the basis of all the available data from all the Internet databases [32].

A bibliometric literary review ensures added value in the management of information on the subject of scientific output in a given field of research. Such an analysis presents the research system and illustrates the role models for the management of scientific output. This facilitates, e.g. the identification of the most productive countries and reveals the main authors. This provides the possibility for scientists to find potential co-workers among the most prolific authors and select the leading magazines of high quality and titles of sources of their publications.

CONCLUSIONS

The analysed material indicates the prevalence of papers from the EU zone, which is the biggest sponsor of this type of research, albeit the state with the largest number of publications on this subject is the USA. The analysis conducted facilitates the conclusion that ski tourism treated as a tourist product in a marketing perception would seem to be an intricate category, which satisfies the needs relating to various psycho-physical and psycho-social spheres in the functioning of an individual.

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