Fifty Years of Research on Vedas : A Bibliometric Analysis

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Abstract

Vedas are gaining a lot of popularity over the world. According to the Scopus database, Vedic research has increased since 2010. However, there has been no bibliometric study on Vedas. Some individuals are inquisitive about how the Vedas may aid in domains such as humanities, arts, computer science, social science, and management, and there are noteworthy differences in the attention this subject has received among the writers. Others are concerned about the ongoing search for potential cures for numerous ailments and the production of missiles. The authors used the Scopus dataset to perform a bibliometric review of Vedic studies from 1970 to 2020 to determine the current trend in Vedic publications. Using Microsoft Excel for descriptive analysis, the annual trend of publishing, top nations of research, and top subjects were investigated. While utilizing VOSviewer software for visual analysis of the data, we looked at the co-occurrence of all keywords, author co-citation, reference co-citation, and journal co-citation analysis. The study concludes that the number of Vedic publications has grown in the last 10 years. We observed 21 nations and regions that are interested in Vedic research. India has a far higher number of publications than the United States and other countries in the Vedas. Arts and humanities, medicine, and engineering are the major fields of research in Vedas, followed by social sciences.

Keywords : **The Vedas, bibliometric analysis, visual analysis, descriptive analysis, VOSviewer, India**

JEL Classification Codes : H0, H80, I0, Z0, Z10

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The Vedas have been the most vibrant words in the world for thousands of years. According to Max Muller, *Rig Veda* is the oldest transcription of India. Vedas are known as the dictionary of knowledge as they include answers to all the questions related to each and everything in this creation. Whatever subject is preached in the Vedas, it was often given through the gods like *Indra, Agni, Varuna, Mitra, Savita, Pusha, Vishnu, Soma*, etc. Somewhere in the Vedic mantras, the qualities and functions of these deities have been described, and at other places, various prayers have been offered to them. From the descriptions of the deities and their prayers, a variety of conclusions emerge from which the teachings of the Vedas on many subjects useful for life are revealed, and light is thrown on various types of physical and spiritual knowledge. At any one place in the Vedas, no one subject is found comprehensively. The Vedas have their distinct style as all things have been preached through the descriptions and prayers of the qualities and actions of various deities.

Fergusson et al. (2018) studied Jainism's personal, social, and environmental sustainability in light of Maharishi Vedic Science and found that Jainism and Maharishi Vedic science are consistent, and they both are based on the thoughts of Vedas. Further, Mohanty and Das (2017) studied the emotional intelligence approach

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from the knowledge of Vedas in Kautilya's *Arthashastra* and found that "the science of wealth" is one of the ancient Indian works that emphasize the effective management of wealth through leadership. They further explored various business lessons and concluded that the role of an emotionally intelligent leader is towards the effective administration of the organization. In addition to this, Chaudhuri and Agnihotri (2019) studied Indian ethos from *Atharva Veda* and found that truth, cosmic order, energy, consecration, austerity, knowledge, and sacrifice uphold the earth, and these are the basic principles of sustaining the universe. Similarly, Mishra (2019) studied the lesson of cultural diplomacy from *The Mahabharata*, and she mentioned that the current Prime Minister of India, Shri Narendra Modi, is following the concepts of *The Mahabharata* for establishing cultural diplomacy as a strategic decision maker to firmly establish India's position in South Asia and the world at large. Kaushal and Mishra (2017) studied the management practices of the Vedas, and they mentioned that the Vedas and Upanishads have been on the grass root of Indian literature, working on the culture and wisdom of ancient times. Furthermore, they mentioned that the Vedas influence management techniques and provide solutions for various managerial and entrepreneurial issues.

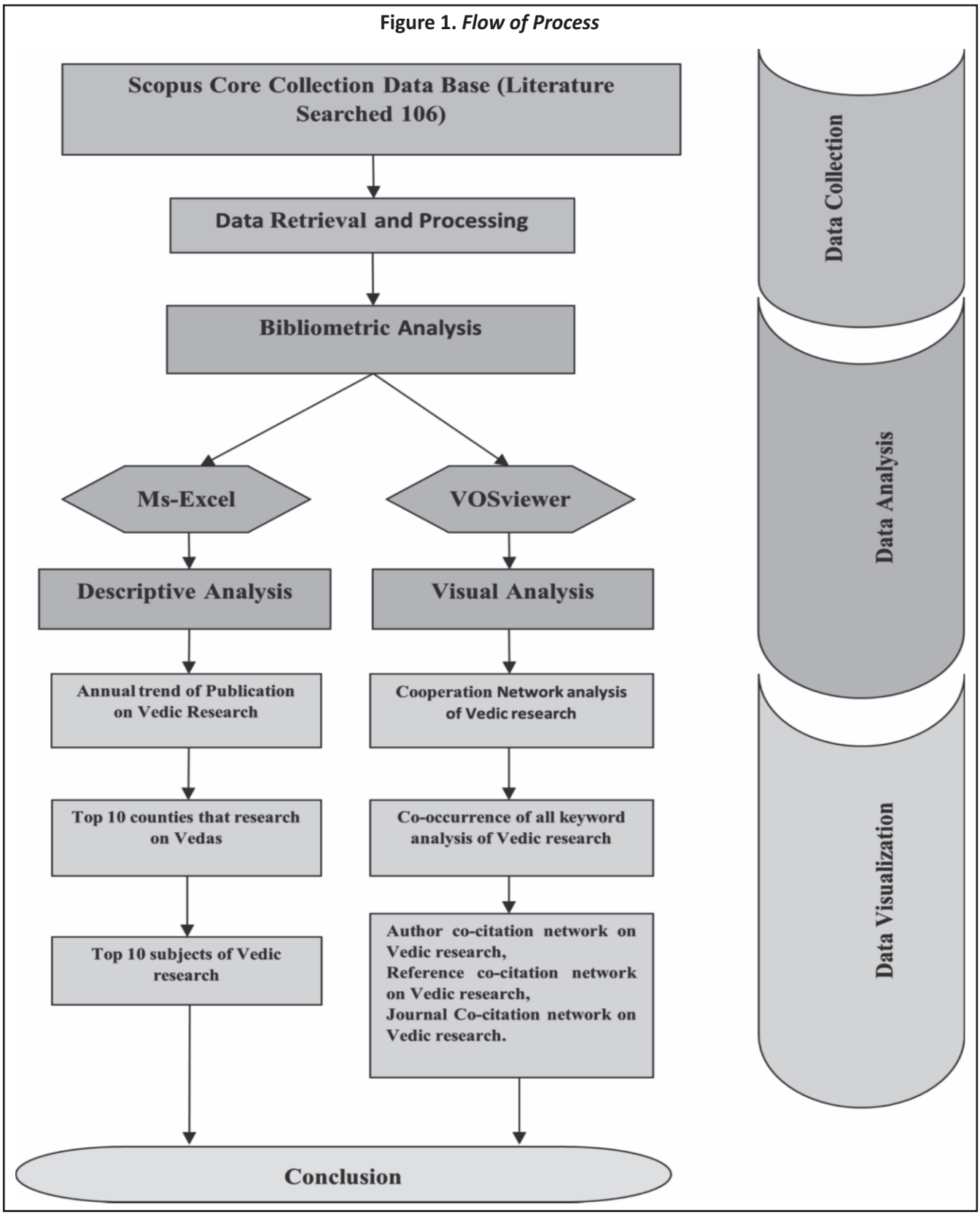
Bibliometrics is a cross-disciplinary study that analyzes bibliographic data using mathematical and statistical techniques. It is a common technique for analyzing research output (Broadus, 1987; Garrigos-Simon et al., 2018). Because of its ability to employ objective data, this approach is well-known (Diem & Wolter, 2013). It can examine certain research areas and draw appropriate judgments (Liao et al., 2018). Some studies analyzed the holistic evaluation of Buddhism literature through bibliometric analysis. Other bibliometric studies analyzed research on Hinduism, Sikhism, and Jainism (Şenel, 2019). In addition, some bibliometric analyses focused on financial literacy (Goyal & Kumar, 2021), entrepreneurial universities (Forliano et al., 2021), industrial wastewater (Mao et al., 2021), blockchain and energy (Ante et al., 2021), sustainability and risk management (Nobanee et al., 2021), environmental management and social marketing (Letunovska et al., 2021), a social media platform for knowledge management (Noor et al., 2020), artificial intelligence in water conversation (Siddiqui et al., 2022), buzz marketing (Mahajan & Gadekar, 2021), and electronic word of mouth (Mahadevan & Joshi, 2021).

There are numerous studies done on many subjects related to bibliometric analysis, but no one has touched the edge of Vedas in the context of bibliometric analysis. This study provides an opportunity for scholars who want to research in the field of Vedas. This research review aims to look at the theoretical evolution and conceptual structure of Vedic knowledge. The following research questions have been addressed in the review:

- **RQ1 :** What is the annual trend of publication in the field of Vedic research ?
- **RQ2 :** What are the top 10 subjects of research in the field of Vedas ?
- **RQ3 :** Which are the top 10 countries that work on Vedas ?
- **RQ4 :** What are those countries that collaborate in writing articles based on Vedas ?
- **RQ5 :** What are the top keywords of research related to Vedas ?
- **RQ6 :** What is the relationship of authors in Vedic research ?
- **RQ7 :** What is the relationship of institutions in Vedic research ?
- **RQ8 :** What is the relationship of author references in Vedic research ?

The authors collected data from the Scopus database and analyzed it using descriptive and visual analysis software to find answers to all these research questions.

Figure 1. ***Flow of Process***



Research Methods and Material

Type of Research

This research is qualitative. Bibliometrics analyses are employed for historical, descriptive, and exploratory data analysis. Silverman (2016) stated that descriptive analysis is designed to explain the characteristics of a specific group or individual; whereas, exploratory analysis is used for investigating a new region or field where there is little understanding of the subject (Johnson et al., 2020).

Data Source, Search, and Extraction Method

On 10th March 2021, Scopus was utilized to conduct a literature search on Vedic research. Scopus is a platform that incorporates numerous sub-databases and a core collection database. Scopus is the most comprehensive database of worldwide publications in various subjects and the most comprehensive citation and abstract database. Only high-impact journals are included in this database. The information was extracted and saved in a CSV file. The results were filtered using the phrase "Research on Vedas" to focus on Vedic-based literature, and papers spanning 1970 – 2020 were identified. All publications published till December 31, 2020, are included in the population. The data retrieved in the end totaled 106 documents from various areas. Document information included title, publication year, keywords, subject categories, abstract, document type, number of cited references and pages, and names of journals publishing the articles.

Data Analysis

Data analysis was performed utilizing tools such as Microsoft Excel and VOSviewer to address all eight research questions. The data were descriptively analyzed using Microsoft Excel, including the yearly publishing trend, the top 10 research subjects, and the top 10 countries that worked on Vedic-based studies. Additionally, VOSviewer software was utilized to do the visual analysis of the data, which aids in the creation of bibliometric presentations of the data in a more creative manner. It is a free licensed program available from Leiden University in Leiden, Netherlands, for visual data analysis. Using this program, we performed cooperative analysis, keyword co-occurrence analysis, author co-citation analysis, reference co-citation analysis, and journal co-citation analysis. Figure 1 depicts the whole flow of the procedure.

Analysis and Results

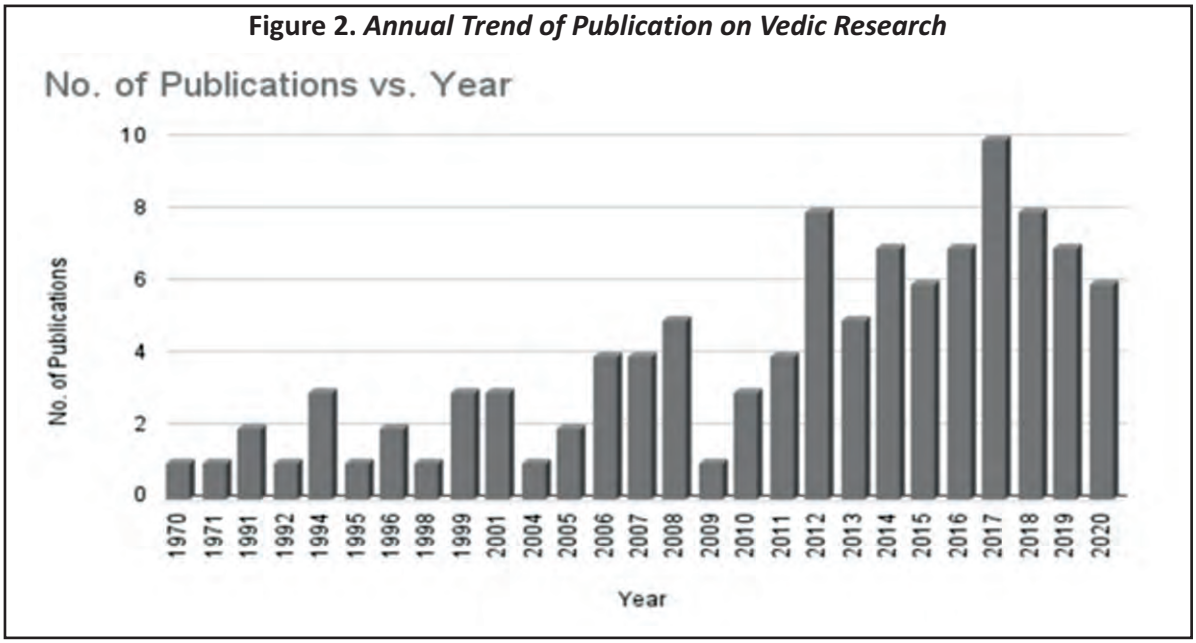
This study involves two types of analysis: descriptive and visual data analysis. The descriptive analysis focuses on the annual trend of publications in the field of Vedas, the top 10 countries that conducted research in the field of Vedas, and the top 10 subjects in Vedas. It was done through Microsoft Office Excel software.

Further, in visual analysis, we focused on the cooperation network analysis, keyword analysis, and co-citation analysis. It was done through VOSviewer software. The keyword analysis focused on finding out the top 11 keywords of research in the field of Vedas. Cooperation network analysis focused on the countries that cooperated for research in Vedas. Further, in co-citation analysis, we focused on three types of analysis: co-citation analysis of cited references, co-citation analysis of cited sources, and co-citation analysis of cited authors.

Annual Trend of Publications on Vedic Research

The first document in the Scopus database related to the Vedas was in 1970. The research has increased slowly in

Figure 2. ***Annual Trend of Publication on Vedic Research***

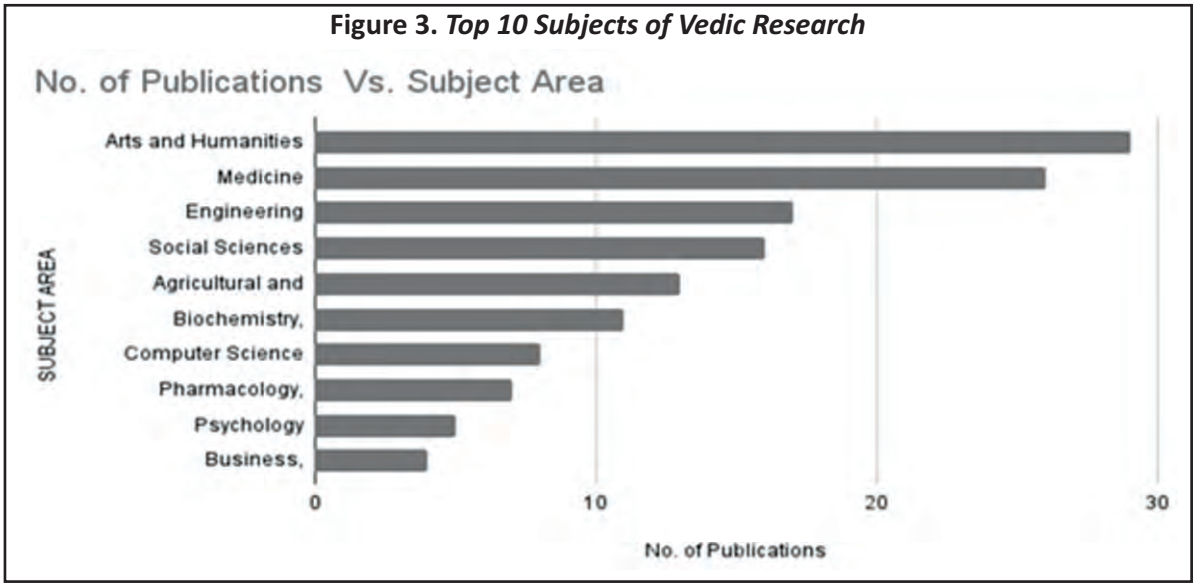


the field of Vedas. From 1970 to 2020, the number of papers published in Vedas is depicted in Figure 2. Figure 2 shows the annual publication of research in the field of Vedas. This trend can be divided into three research stages: 1970–2000, 2001–2010, and 2011–2020. The period from 1970 –2000 was one of the lowest output explorations. It includes only 15 articles. Before 2000, the number of articles published in the Scopus database related to the Vedas was meager; it shows that a maximum of three articles were published in a year. After that, a positive change is observed in the period from 2001–2010. In this period, a total of 23 articles were published in Scopus. The number of publications in this period somehow increased, and it touched the level of a maximum of five papers published in a year in 2008. After that, between 2011–2020, there was a sudden increase in the publication of articles related to the Vedas. The total number of publications in this period was 68. It shows that the people in this period were more interested in Vedic-based research and were more focused on the Vedic-based solutions to the problems. In the year 2017, 10 papers were published related to the Vedas. This trend showcases a progressive trend in the field of research related to Vedas.

Top 10 Subjects of Vedic Research

As per the data, there are 24 subjects in which research on Vedas has been conducted by various authors from 1970 – 2020. Figure 3 shows the top 10 subjects of research in the field of Vedas: arts and humanities; medicine; engineering; social sciences; agricultural and biological sciences; biochemistry, genetics, and molecular biology; computer sciences; pharmacology, toxicology, and pharmaceutics; psychology; and business, management, and accounting. Arts and humanities is the topmost subject in the field of Vedic research. This subject contributes 29 documents in this field. After that, medicine is the second topmost subject in this field. It contributes 26 documents in this field of research. Engineering is the third topmost subject of research in the field of Vedas, with 17 documents. The fourth top subject of research in the field of Vedas is social sciences, with 16 documents. After that, the fifth research subject in the field of Vedas is agricultural and biological sciences, and it contributes 13 documents. The sixth research subject is biochemistry, genetics, and molecular biology, with 11 articles, followed by the seventh research subject, computer sciences, with eight articles. The eighth research subject is related to

Figure 3. ***Top 10 Subjects of Vedic Research***

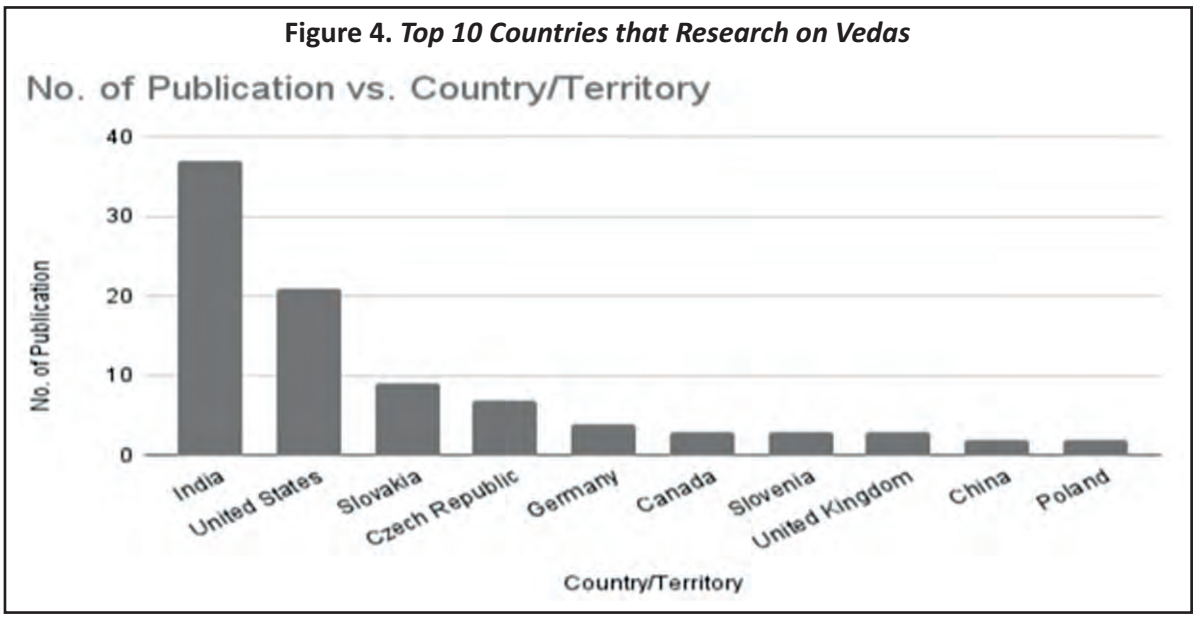


pharmacology, toxicology, and pharmaceutics contributing seven articles. The ninth research subject is psychology, which contributes five articles, and the last (10th) subject of research is business, management, and accounting with four articles.

Top 10 Countries that Research into Vedas

As per the data, it has been observed from Figure 4 that India is the top country that works on Vedic research, followed by the United States, Slovakia, Czech Republic, Germany, Canada, Slovenia, United Kingdom, China, and Poland. The data shows that India has published 37 documents in the field of Vedic research. This shows that

Figure 4. ***Top 10 Countries that Research on Vedas***



India is the top country trying to find solutions from the Vedas. The second top country in the field of research related to Vedas is the United States. The United States published 21 documents. The third top country in the field of Vedic research is Slovakia. This country has published nine research papers in this field. The fourth one is the Czech Republic, a landlocked country in Europe. This country has published seven papers so far in Vedic research. The top fifth country in the field of Vedic research is Germany. This country has published four documents so far in the database. Canada, Slovenia, and the United Kingdom are in the sixth, seventh, and eighth top most countries with three articles each. China and Poland are the top ninth and tenth countries, with two articles each. The results of the analysis show that worldwide, Vedic-based research has been going on since the last few decades, which shows there is more opportunity for research in the field of Vedas in the coming future as the world is slowly moving toward Vedic knowledge and many researchers are trying to find solutions of problems through the Vedas.

Visual Analysis

Cooperation Network Analysis of Vedic Research

For this paper, we used the co-authorship function in the VOSviewer to obtain the cooperative network. Figure 5 shows that the authors of the countries have two large groups. The first cluster presents the cooperation network between India, the United States, and Canada. As depicted in Figure 5, India is the most connected country with a group of countries. The second cluster includes three countries: China, Germany, and the United Kingdom.

Co-occurrence of all Keyword Analysis of Vedic Research

Keywords are the most crucial part of any research paper. Keywords provide information about the content of the research paper. A keyword co-occurrence occurs when two or more keywords appear simultaneously in the same document. The co-occurrence of keywords at various levels of research units establishes the network – actor linkages (Su & Lee, 2010). The purpose of this is to find out the most important research topics in the field of Vedas. In this study, only all keywords of the articles are considered. In this study, we use VOSviewer to find out the co-occurrence of all keywords with full counting of keywords and selected five minimum number of keywords in an article.

Figure 5. ***Cooperation Network Analysis of Vedic Research***

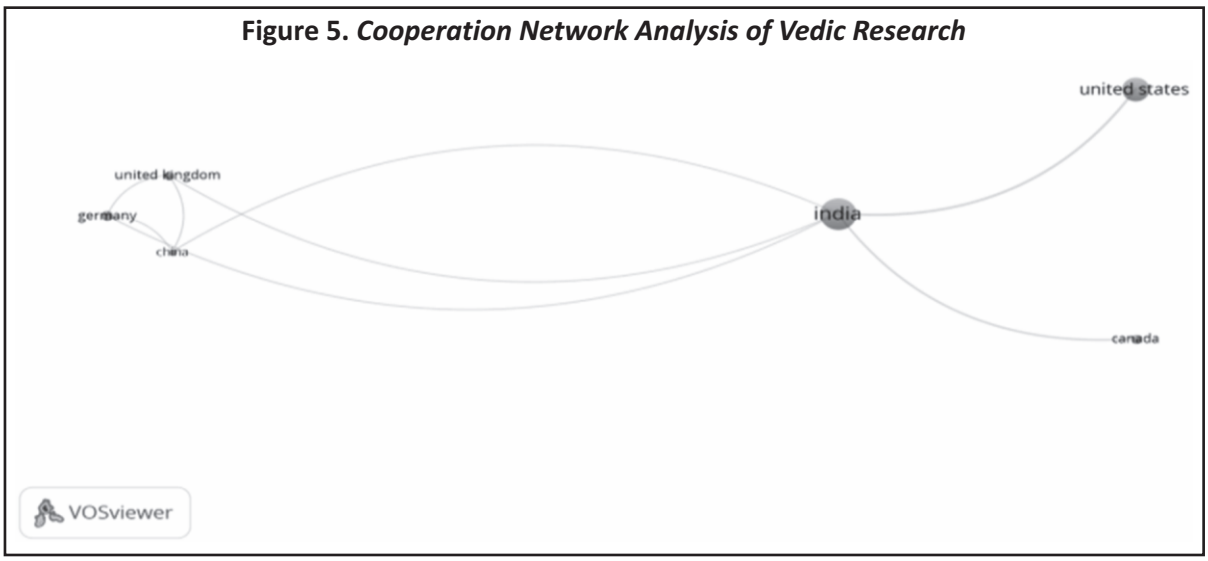


Table 1. ***Top 11 High Occurrence of Keywords***

Ranking	Phrases	Count	Ranking	Phrases	Count
1	Human	21	7	Medical research	6
2	Article	15	8	Research	6
3	India	10	9	Review	6
4	History	7	10	Medicine, ayurvedic	5
5	Humans	7	11	Priority journal	5
6	Ayurveda	6			

Figure 6. ***Co-occurrence of all Keyword Analysis of Vedic Research***

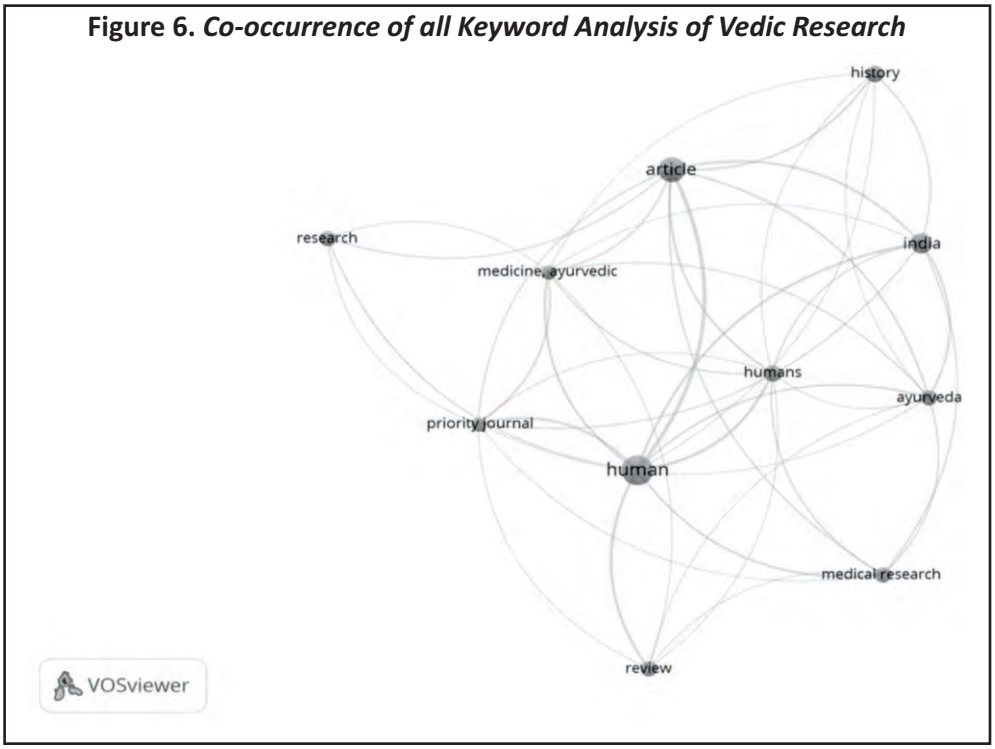
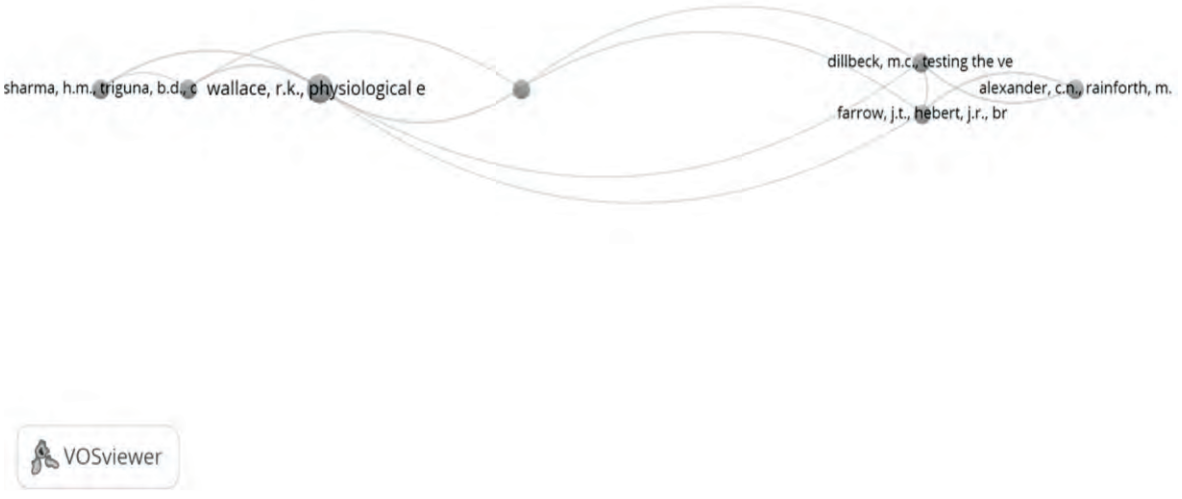


Table 1 shows the top co-occurrence of keywords. A total of 11 hotspots were found in the articles. Human is the most occurred keyword with 21 counts, followed by article, India, history, humans, Ayurveda, medical research, research, review, medicine, Ayurvedic, and priority journal.

Figure 6 presents three clusters of all keywords related to Vedic-based research. This figure defines the three different clusters of the keywords. The first cluster is led by "Human," with four items containing "humans," "medical research," and "review." The second cluster is led by "Article," with four items containing "history," "India," and "Ayurveda." The last third cluster is led by "Research," with three items, "priority journal," "medicine," and "ayurvedic."

The size of the node specifies the occurrences of the keyword. Big size nodes define this as the most occurred keyword in the articles. In this figure, the *Human* keyword node is huge, which shows that this is the most occurred keyword in the articles.

Figure 7. ***References' Co-Citation Network on Vedic Research***



References Co-Citation Network on Vedic Research

A connection that is established by citing authors is called co-citation. It is the frequency with which two items of earlier literature are cited together by the later literature (Small, 1973). The co-citation of reference identifies the central research theme about the research related to Vedas (Garrigos-Simon et al., 2018). In this paper, we have selected a minimum of two citations of a cited reference. Figure 7 shows that there are two clusters of references. The first cluster has four items. Alexander et al. (1991) are cited twice in this cluster and have four links. Orme-Johnson (1973) is cited two times and has five links. Sharma et al. (1991) are cited twice and have three links. Wallace (1970) is cited four times and has a total of eight link strengths. The second cluster has three items. Alexander et al. (1991) are cited twice and have four links. Dillbeck (1983) is cited two times and has a total of six link strengths. Farrow (1982) is cited two times and has a total of six link strengths.

Journal Co-Citation Network on Vedic Research

Figure 8 represents the co-citation of cited source analysis. Figure 8 represents the network diagram related to the relationship of the journals collaborating for doing research in Vedas. The minimum number of citations of a source is taken as 10. VOSviewer identifies two clusters, and Figure 8 shows the clusters. The first cluster shows that the *Journal of Indian Philosophy* has 36 citations and has two link strengths. In this cluster, *Science* is the second journal that has 12 citations and 43 links related to other journals. The second cluster includes two items. *Jainism and Ecology : Nonviolence in the Web of Life* has 10 citations and a total of 20 links with other journals. In this cluster, the second journal is *Scientific Research on Transcendental Meditation,* which has 13 citations and a total of 41 links.

Author Co-Citation Network on Vedic Research

The last analysis focuses on the network analysis of cited authors. Figure 9 presents the co-citation relationship of cited authors. For finding the cited authors' co-citations, we used an author's minimum number of citations as 10. Figure 9 shows that two clusters represent the data. Cluster one includes four items. Alexander et al. (1991) have

Figure 8. ***Journal Co-Citation Network on Vedic Research***

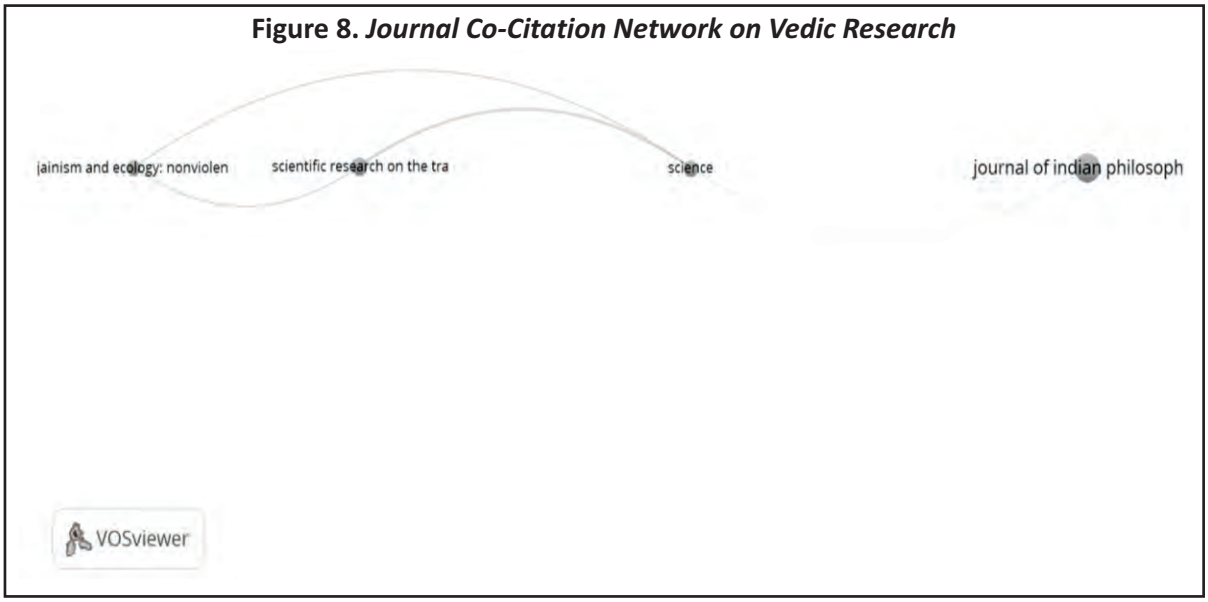
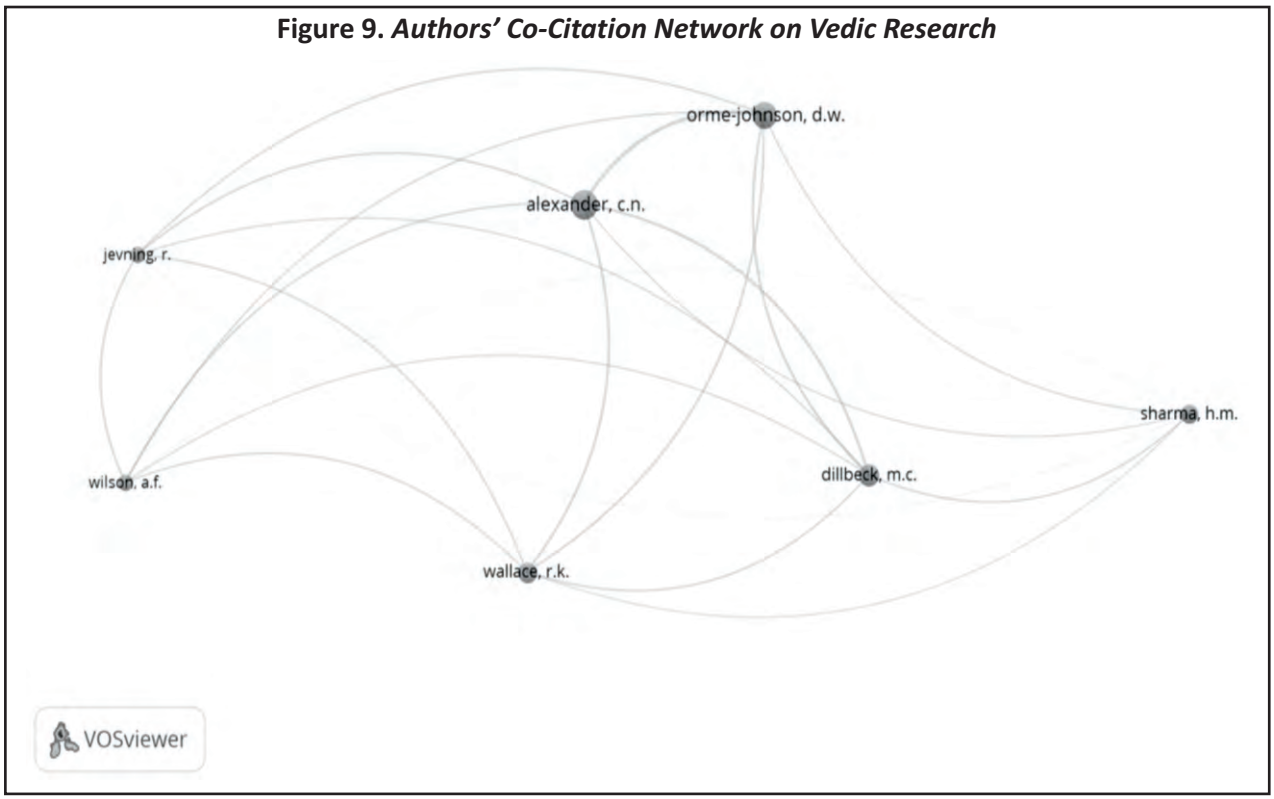


Figure 9. ***Authors' Co-Citation Network on Vedic Research***



760 links with 35 citations. Dillbeck (1983) has 535 links with 21 citations. Orme-Johnson (1973) has 689 links with 28 citations. Sharma et al. (1991) have 218 links with 15 citations. The second cluster includes three items. Jevning et al. (1983) have 394 links with 12 citations. Wallace (1970) has 501 links with 19 citations. Wilson and Davidson (1978) have 367 links with 11 citations.

Discussion and Conclusion

This study analyzes the importance of Vedas and the research related to Vedas with the use of descriptive and visual analysis of data using bibliometrics. The results of the study lead to the following conclusions. Firstly, an analysis of trends in Vedic research shows a progressive interest in the field of Vedas after 2010. It is observed that more and more researchers are interested in Vedas to find solutions to their problems in the current scenario. Second, the analysis of the top 10 subjects of Vedic research shows that arts and humanities is the top subject with 29 publications, followed by medicine, engineering, social sciences, and other subjects. The third analysis focuses on the top countries that work on Vedas. The results of the analysis showcase that India is the first top country with 37 publications in Scopus, followed by the United States, Slovakia, Czech Republic, Germany, and other countries. The fourth analysis is related to the cooperation network. It shows that India is the most connected country, followed by the United States, Canada, Germany, China, and the United Kingdom.

Further, the fifth analysis focuses on the keywords of the Vedic research. As per the data, there are 11 hotspot areas. Human is the top keyword with 21 counts, followed by article, India, history, humans, Ayurveda, and other keywords. The sixth analysis shows the co-citations of the cited references. The seventh analysis shows the co-citation network of journals. It shows two clusters with two items each. The last analysis is a co-citation of cited author's analysis. It shows the network of cooperation between the authors. Two clusters are present in the network diagram. Alexander (1991) has the highest link with 760 link strength.

The ancient Vedas' knowledge and wisdom demonstrate the proper way for modern-day businesses. In a nutshell, we can say that more and more research on Vedas will be done in the future in the field of arts and humanities, social sciences, medicine, management, and other top subjects.

Theoretical and Practical Implications

The study's findings provide academics and practitioners with information on the present state of research in Vedas. It may also be used to identify prospective research gaps in the literature. The study provides statistics on publishing patterns and the top nations researching Vedic philosophies, so it motivates researchers to pursue research on this topic. Furthermore, this research will aid researchers in locating journals where they may easily publish their findings in a Scopus-based publication. It also gives an overview of the universities that have partnered to conduct the studies. Finally, the researchers can use the co-occurrence of keywords analysis of the data to determine their possible areas of investigation.

Limitations of the Study and Future Recommendations for Research

Despite the amount of time and effort put into this research, it does have certain limitations. First, this study offers bibliometric data from Vedic papers abstracted from the Scopus database. Researchers may also conduct their research using other databases like Web of Science, Publons, and Google Scholar. Second, because specific non-English papers were not included in the Scopus database, they were not examined in this study. Third, because bibliometric data changes over time, various conclusions may emerge as time goes on. As a result, this research should be updated in the future. Fourth, the bibliometric analysis may not accurately reflect the citations since freshly released research articles are not always cited often, but the total number of times cited is expected to rise in the future. Fifth, other texts linked to Vedic research, such as *The Bhagavad Gita*, *The Mahabharata,* Kautilya's *Arthashastra*, and other ancient Indian scriptures were not included in this study; nevertheless, researchers can include all of these scriptures as additional variables in their studies.

Authors' Contribution

Prof. Dr. Pankaj Madan perceived the idea of studying Vedic-based research and designed the strategy for research in the field of Vedas. Deeksha Ahuja researched and found the research gap where a study could be conducted. Deeksha worked on collecting the data related to the research done on Vedas and accessed the Scopus data from IIT Roorkee. Further, Dr. Madan conducted a descriptive analysis of the data. Deeksha Ahuja did a visual analysis of the data. Finally, with a joint effort, both the authors wrote the discussion, conclusion, limitations, and scope for future research.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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