

Analysis of English Articles on Occupational Health and Safety in the WoS and Scopus Databases in Turkey with Scientific Mapping Techniques (2000–2023)

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ABSTRACT

The main purpose of this article is to examine the literature on occupational health and safety and analyze it using the scientific mapping method. The scientific mapping method was used as a method in the research. A few studies have conducted a comprehensive survey analysis for occupational health and safety using the scientific mapping method. The subject and analysis study examined in this research will contribute to interdisciplinary fields of science. This method examines the publications on the subject in detail and reveals detailed frequency and statistics about the document, year, author, and keywords. The data collection process for this research was accessed from the Web of Science (WoS) and Scopus databases between July 15 and August 30, 2023. This study only covers academic English-language articles on occupational health and safety in Turkey between 2000 and 2023. The data were analyzed using the scientific mapping method in the R Studio Biblioshiny software program. The findings of the research were examined in two steps: in the first step, the numerical data and graphics obtained from the databases were evaluated, and in the second step, these data were analyzed and explained one by one in the software program. As a result of this research, a comprehensive literature review on occupational health and safety has been presented, revealing the strengths of existing publications. It is aimed at giving researchers an idea about occupational health and safety in the future. The data were analyzed using the scientific mapping method in the R Studio Biblioshiny software program. The findings of the research were examined in two steps: in the first step, the numerical data and graphics obtained from the databases were evaluated, and in the second step, these data were analyzed and explained one by one in the software program. As a result of this research, a comprehensive literature review on occupational health and safety has been presented, revealing the strengths of existing publications. It is aimed at giving researchers an idea about occupational health and safety in the future.

KEYWORDS

Occupational Health and Safety, Occupational Health, Science Mapping, Web of Science database (Wos), Scopus database.

INTRODUCTION

The occupational health and safety of workers is an employee's defense against injustices in the workplace. Some of the main areas covered by occupational health and safety rights include the roles employers and workers play in the workplace, ideas on how to solve problems, and the role of inspectors and workers' "participation" during consultations. In general, these laws protect both the employer and the employee to ensure that a good working relationship is maintained. The payoffs are huge: it means increased employee productivity, increased profits, and increased consumer confidence. In many countries, trade union representatives are fighting for the rights of their workers. However, there are also laws that regulate these rights and provide guidelines that must be followed. These laws often cover areas such as compensation, privacy, and employee safety. Workers' health and safety rights are often included in common law and are divided into subcategories emphasizing the details. Although previous review studies have provided valuable information and research directions for occupational health and safety, few studies have conducted a comprehensive survey analysis for occupational health and safety using the scientific mapping method. The subject and analysis study

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examined in this research will contribute to interdisciplinary fields of science such as emergency aid and disaster management, business, business management, health management, social service, health administration and construction, and architecture.

In the literature, several reviews of research regarding “occupational health and safety” have been performed from different perspectives. Books on occupational health and safety (Burke et al., 2011; Reese, 2018; Pillay & Tuck, 2018, Friis, 2015, Burke & Richardsen, 2019; Turk, 2018; Kelloway et al., 2011; Goetsch & Ozon, 2011), digitizing production systems (Ulu & Birgün, 2022) and literature review affecting young workers (Laberge & Ledoux, 2011), small enterprises (Hasle & Limborg, 2006), measurement properties of occupational health and safety management audits (Robson & Bigelow, 2010), effectiveness of occupational health and safety regulatory enforcement (Tomba et al., 2016), models, methods, and applications (Liu et al., 2023), critical factors of success and barriers to the implementation (da Silva & Amaral, 2019), legislation and regulatory enforcement planning and implementation (MacEachen, 2016), garment industry (Hamja et al., 2019) and nanomaterial (Dimou & Emond, 2017), education (Marshall, & Mackey, 1995; Arezes, & Swuste, 2012; Balanay et al., 2014; Reinhold et al., 2014; Mouneer, 2021). Also architecture and architectural education (Smallwood, 2020; Manu et al., 2019; Hoeft & Trask, 2022; Khan et al., 2022; Mariam et al., 2021; Poghosyan et al., 2020) and occupational health and safety in Turkey (Başağa et al., 2018; Ulutasdemir et al., 2015; Artvinli, 2016; Gümüş, R., & Gülsün, 2020; Karaca, 2015; Şenkal et al., 2021; Bahşi & Kendi, 2019; Ulubeyli et al., 2014).



Figure 1. “Occupational Health, Safety, and Environment” (URL-1).

Figure 1 shows the code of business conduct about “Occupational Health, Safety, and Environment” (URL-1).

- o Quality of life and safety of employees,
- o Compliance with environmental laws and requirements,
- o Hazard prevention measures and safety policies,
- o Improvement of working conditions and environment,
- o Environmental and safety activities,
- o Health examinations for existing employees and new hires.

Therefore, in this study, we conduct a systematic literature review on occupational health and safety based on publications. English articles from the Web of Science (WOS) database and the Scopus database were identified and analyzed using the science mapping technique. The main purpose of this review is to answer the following questions: 1) Which occupational health and safety article publications

are available in the literature? 2) What are the trending concepts, topics and publications in research on occupational health and safety?



Figure 2. Occupational safety and health wordcloud (Mbachu, 2023).

METHODOLOGY

The methodology of this article is shown in Table 1, which shows the detailed review procedure for this research. According to this, phase 1: literature search; phase 2: data collection; and phase 3: data analysis.

Web of Science database search keywords: Results for "Occupational Health and Safety" (Topic) OR "Occupational Health" (Topic) OR "Health and Safety" (Topic) and TURKEY or TURKIYE (Countries/Regions) and Article (Document Types) and English (Languages).

Scopus database search keywords: (title-abs-key ("occupational health") or title-abs-key ("occupational health and safety")) and pubyear > 2000 and pubyear < 2024 and (limit-to (doctype , "ar")) and (limit-to (language , "english"))

Table 1. Research Methodology.

Research Methodology			
		Search Criteria:	
Phase 1	Literature Search	Topic	"Occupational Health and Safety" OR "Occupational Health" OR "Health and Safety"
		Publication Years	2000-2023
		Document types	Article
		Countries/Regions	Turkey
		Search Keywords:	
Phase 2	Data Collection	Web of Science database	"Occupational Health and Safety" (Topic) OR "Occupational Health" (Topic) OR "Health and Safety" (Topic) and TURKEY or TURKIYE (Countries/Regions) and Article (Document Types) and English (Languages).
		Scopus database	(title-abs-key ("occupational health") or title-abs-key ("occupational health and safety")) and pubyear > 2000 and pubyear < 2024 and (limit-to (doctype , "ar")) and (limit-to (language , "english"))
Phase 2	Data Analysis	Bibliometric Analysis	
		Analysis of R Studio Biblioshiny	

RESULTS

RESULTS OF SCOPUS DATABASE

In this section, the graphics of the Scopus database data are shown. There are no comments by the author on these charts. The same form as accessed in the database has been added to the article. [Figure 3](#) shows the graph of the number of documents by year. It is at its peak in 2022.

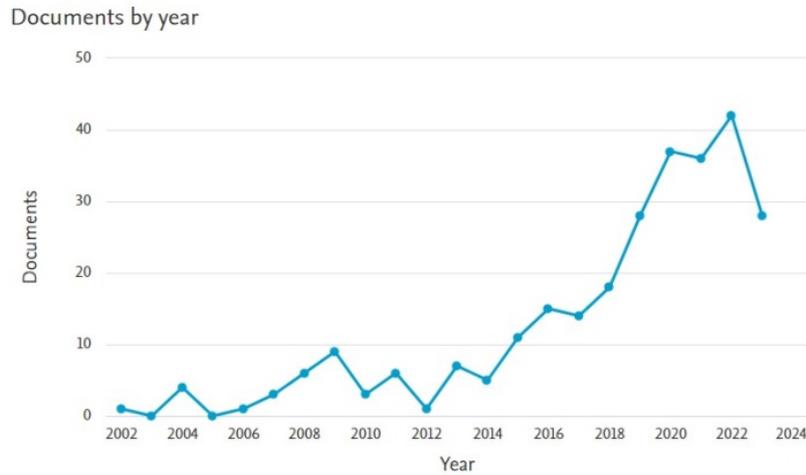


Figure 3. Documents by year (Scopus, 2023).

[Figure 4](#) shows the graph of the number of documents by subject area. Engineering has 145 documents (22,6%), Social Sciences 117 documents (18,2%), Medicine 116 documents (18,1%), Environmental Sciences 84 documents (13,1%), Computer Sciences 28 documents (4,4%), Business, Management, and Accounting 25 documents (3,9%), and Chemical Engineering, Energy, and Pharmacology, Toxicology, and Pharmaceutics 14 documents (2,2%).

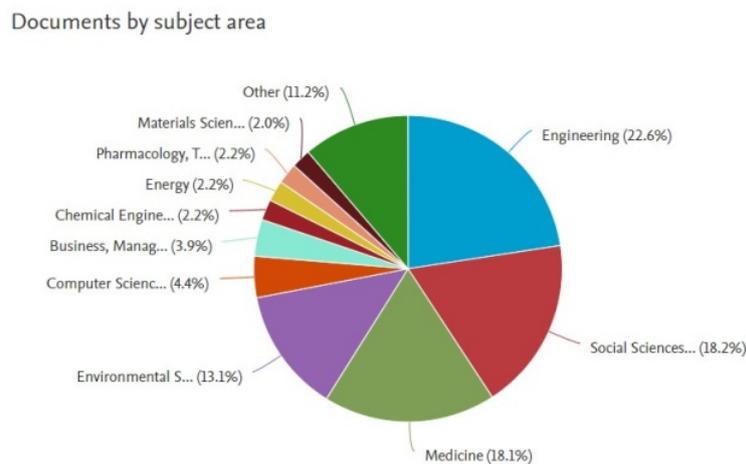


Figure 4. Documents by subject area (Scopus, 2023).

[Figure 5](#) shows the graph of the number of documents by affiliations. According to [Figure 2](#), most documents by affiliation are “Yıldız Technical University,” “Istanbul Technical University,” and “Gazi University” ([Figure 5](#)).

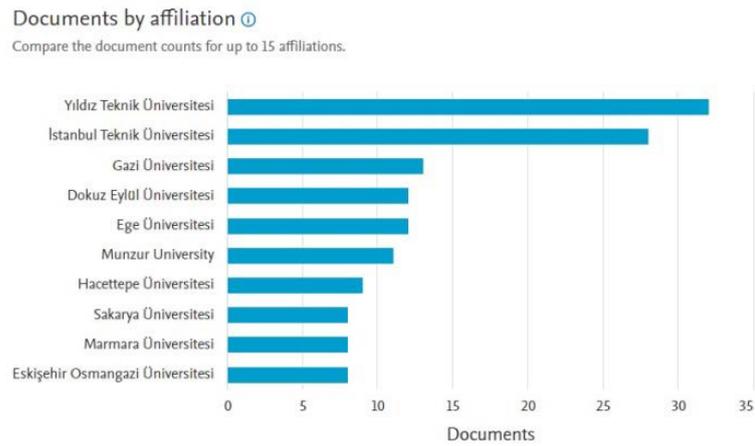


Figure 5. Documents by affiliation (Scopus, 2023).

Figure 6 shows the graph of the number of documents by author in the Scopus database.

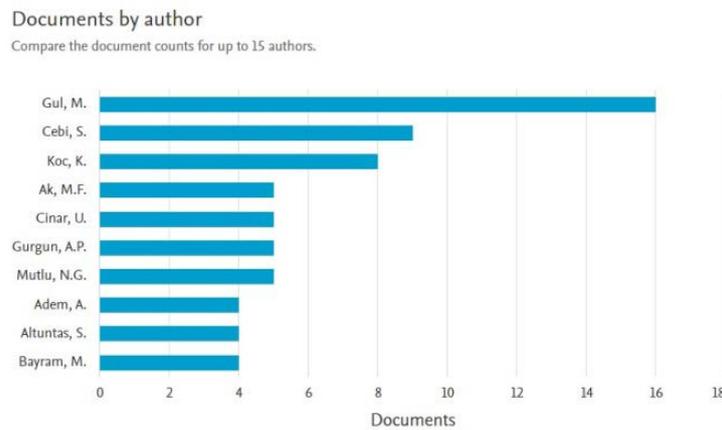


Figure 6. Documents by author (Scopus, 2023).

RESULTS OF WEB OF SCIENCE DATABASE

In this section, the graphics of the Web of Science database data are shown. There are no comments by the author on these charts. The same form as accessed in the database has been added to the article. Figure 7 shows the graph of the tree map chart categories. The areas on the chart are not strictly proportional to the values of each entry. But percentages and ratios are listed statistically.

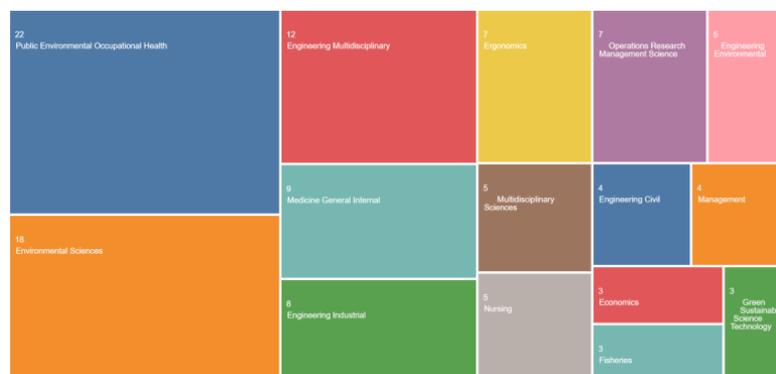


Figure 7. TreeMap Chart (WoS, 2023).

Table 2. Analysis of selected from publications.

Web of Science Categories	Record Count	% of 119
Public Environmental Occupational Health	22	18.487%
Environmental Sciences	18	15.126%
Engineering Multidisciplinary	12	10.084%
Medicine General Internal	9	7.563%
Engineering Industrial	8	6.723%
Ergonomics	7	5.882%
Operations Research Management Science	7	5.882%
Engineering Environmental	5	4.202%
Multidisciplinary Sciences	5	4.202%

RESULTS OF SCIENCE MAPPING

In this section, we analyze the graphics of using R Studio Biblioshiny software. Figure 8 below shows the most relevant source. These sources “International Journal of Occupational Safety and Ergonomics” 7 documents, “Safety Science” 6 documents, “Fresenius Environmental Bulletin” 5, “International Journal of Contemporary Economics and Administrative Sciences (IJCEAS) 3 documents, “Safety and Health Work” 3 documents, “Applied Ecology and Environment Research” 2 documents, “Human and Ecological Risk Assessment” 2 documents, and “Industrial Health” 2 documents (Figure 8).

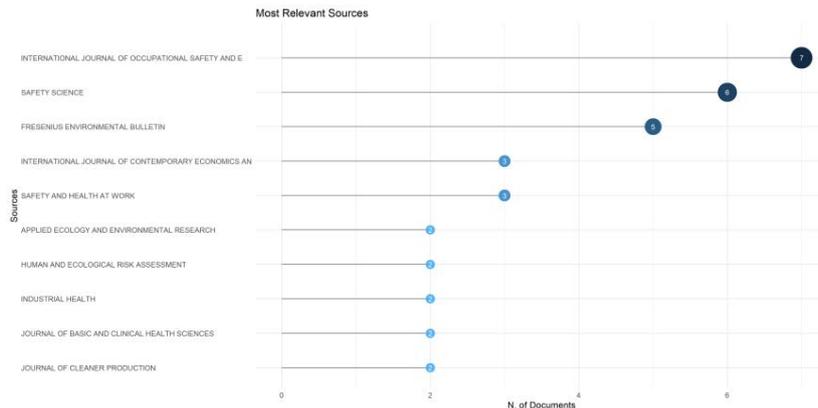


Figure 8. Most relevant source.

Figure 9 below shows the three-field plot analysis. According to this analysis, the results of the question-author-keywords analysis were visualized. Most use author keywords: “occupational health and safety,” “Turkey,” safety,” education,” “analysis hierarchy process,” agriculture,” “construction industry,” and “occupational disease” (Figure 9).

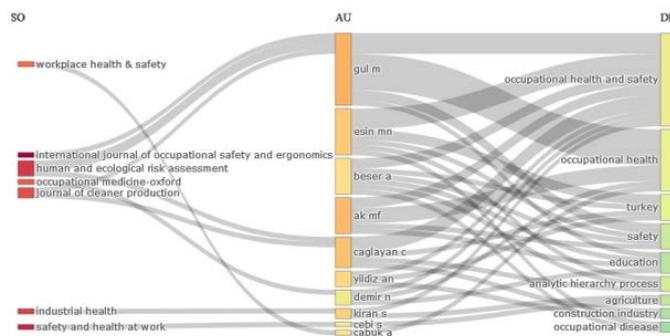


Figure 9. Three Field Plot analysis.

Figure 10 below shows the most relevant word analyses. These words: “occupational health and safety”, “occupational health”, “Turkey”, “risk assessment”, “analytic hierarchy process”, “safety”, “agriculture”, “education”, “construction industry”, “occupational disease”, “occupational safety”, “risk analysis”, “work environment”, “curriculum”, “employees”, “evaluation”, “fahp,” fmea”, “fuzzy”, “globalization”, “health and safety”, “health literacy”, “health promotion”, “learning styles”, and “hospitals” (Figure 10).

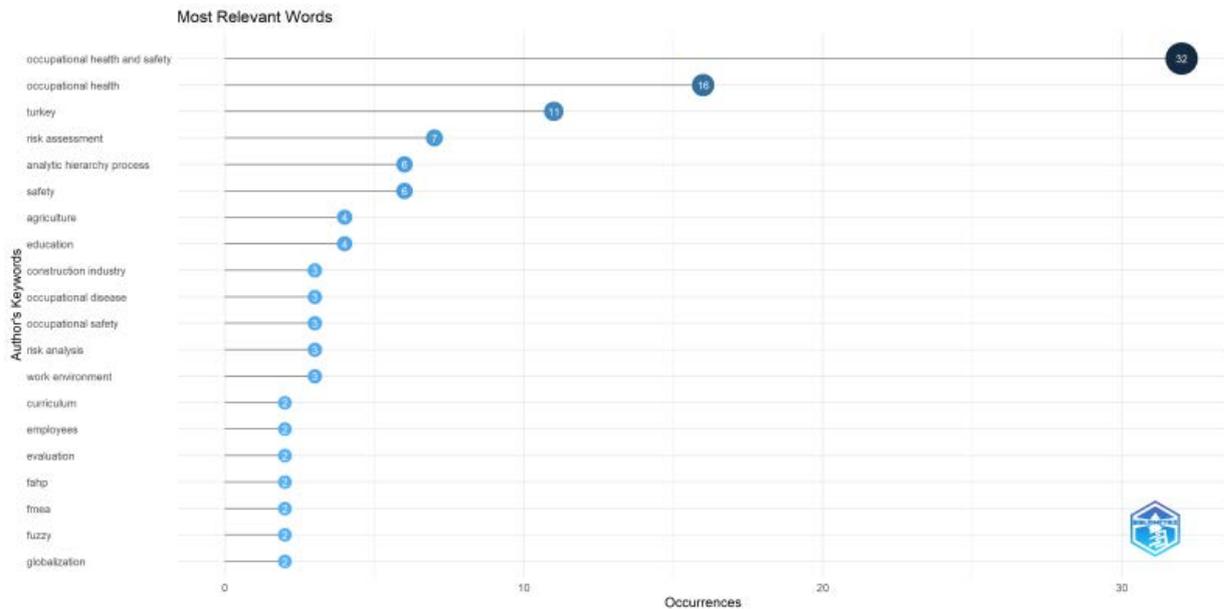


Figure 10. Most relevant words.

Figure 11 and Table 3 show the graph of the trending topic words and the frequency analysis according to the years. The term frequency is to the right of the graph (10-20-30) using the R Studio Biblioshiny software interface (Figure 11).

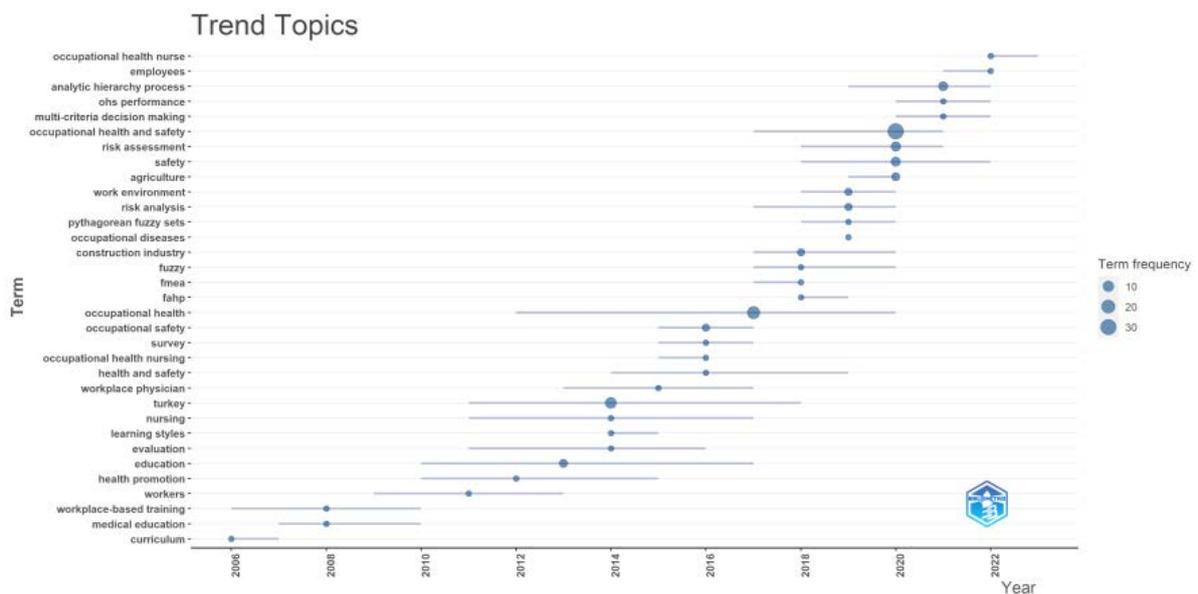


Figure 11. Trend topics author keywords.

Table 3. Trend topics frequency analysis.

item	freq	year_q1	year_med	year_q3	item	freq	year_q1	year_med	year_q3
occupational health and safety	32	2017	2020	2021	evaluation	2	2011	2014	2016
occupational health	16	2012	2017	2020	learning styles	2	2014	2014	2015
turkey	11	2011	2014	2018	nursing	2	2011	2014	2017
education	4	2010	2013	2017	workplace physician	2	2013	2015	2017
occupational safety	3	2015	2016	2017	health and safety	2	2014	2016	2019
construction industry	3	2017	2018	2020	occupational health nursing	2	2015	2016	2016
risk analysis	3	2017	2019	2020	survey	2	2015	2016	2017
work environment	3	2018	2019	2020	fahp	2	2018	2018	2019
curriculum	2	2006	2006	2007	fmea	2	2017	2018	2018
medical education	2	2007	2008	2010	fuzzy	2	2017	2018	2020
workplace-based training	2	2006	2008	2010	occupational diseases	2	2019	2019	2019
workers	2	2009	2011	2013	pythagorean fuzzy sets	2	2018	2019	2020

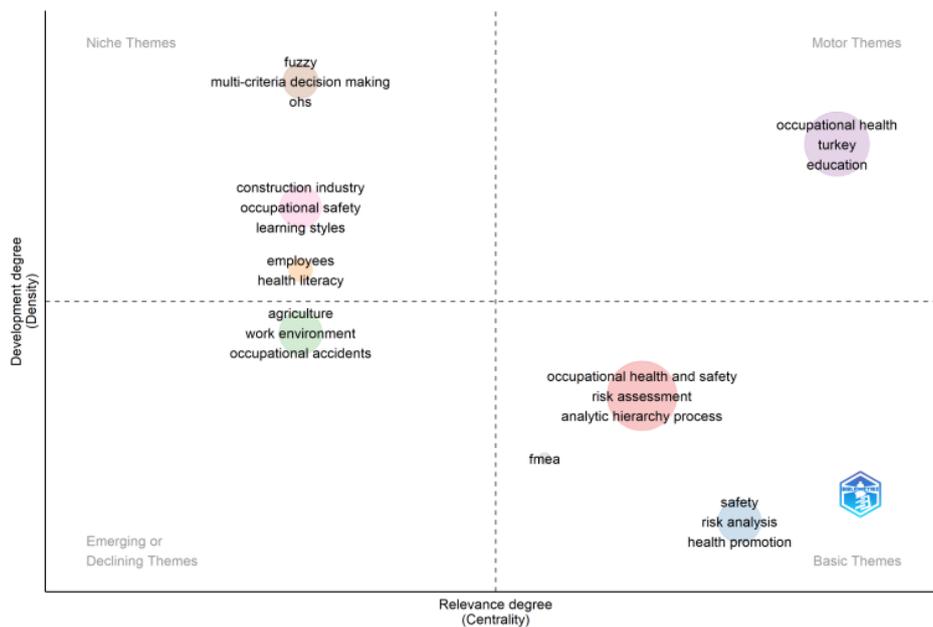


Figure 12. Thematic map.

Figure 12 and Table 4 show the graph of the thematic map words and the frequency analysis. Density analysis (development degree) and centrality analysis (relevance degree) using the R Studio Biblioshiny software interface (Figure 12).

Table 4. Thematic map cluster.

Occurrences	Words	Cluster	Cluster_Label	btw centrality	clos centrality	pagerank centrality
32	occupational health and safety	1	occupational health and safety	543,018491	0,00952381	0,111765217
7	risk assessment	1	occupational health and safety	110,3960784	0,006711409	0,04905645
6	analytic hierarchy process	1	occupational health and safety	91,17448826	0,007092199	0,034664838
3	occupational disease	1	occupational health and safety	22,2	0,006666667	0,010012216
2	fahp	1	occupational health and safety	11,01190476	0,006993007	0,016075024
2	globalization	1	occupational health and safety	0	0,005128205	0,009524852
2	hospitals	1	occupational health and safety	5	0,006369427	0,019422233
2	pythagorean fuzzy sets	1	occupational health and safety	72,25971773	0,007518797	0,018980778
2	training	1	occupational health and safety	0	0,005524862	0,013625822
2	underground mining	1	occupational health and safety	18,7311463	0,007246377	0,013347499
2	vikor	1	occupational health and safety	18,7311463	0,007194245	0,009565708
2	workplace physician	1	occupational health and safety	53,6	0,007352941	0,014474012
6	safety	2	safety	155,8125296	0,006756757	0,032596869
3	risk analysis	2	safety	0	0,005291005	0,012189599
2	health promotion	2	safety	6,533333333	0,005988024	0,012828804
2	workers	2	safety	30,07472527	0,007042254	0,011810412
4	agriculture	3	agriculture	12,67527473	0,006535948	0,021823748
3	work environment	3	agriculture	127,8696078	0,007575758	0,015813407
2	occupational accidents	3	agriculture	101,8243662	0,008	0,017157657
2	occupational diseases	3	agriculture	84,38773612	0,007246377	0,01346664
2	work safety	3	agriculture	4,841941392	0,006134969	0,011381992
16	occupational health	4	occupational health	196,9880645	0,007518797	0,063994277
11	turkey	4	occupational health	147,9813422	0,007246377	0,076550776
4	education	4	occupational health	50,31111111	0,005555556	0,03587067
2	curriculum	4	occupational health	5,7	0,005524862	0,02795758

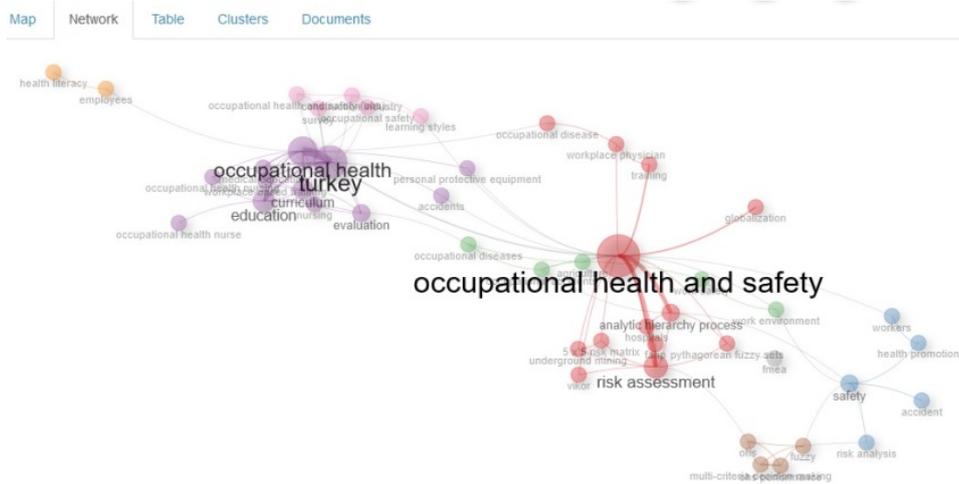


Figure 13. Thematic map/network analysis using R Studio- Biblioshiny software interface.

Finally, [Figure 13](#) shows thematic map/network analysis using the Biblioshiny software interface. In this network analysis, the links between the words of the publications on occupational health and safety are seen in [Figure 13](#). In network analysis, large circles and colors represent frequencies and clusters.

CONCLUSION

Occupational health and safety is one of the most important human concerns. It aims to improve the working environment for employees to develop and maintain the maximum degree of physical, mental, and social well-being in all jobs. A healthy workforce can benefit businesses in a variety of ways, including increased productivity, enhanced employee morale, and less absenteeism. A safe and healthy workplace can also prevent accidents and injuries, cutting healthcare costs and potential legal consequences for businesses. As a result, the primary goal of this paper is to examine and analyze the literature on occupational health and safety using the scientific mapping technique. The scientific mapping approach was employed as a research method. The scientific mapping method was used as a method in the research. This method examines the publications on the subject in detail and reveals detailed frequency and statistics about the document, year, author, and keywords. The data were analyzed using the scientific mapping method in the R Studio Biblioshiny software program. The findings of the research were examined in two steps: in the first step, the numerical data and graphics obtained from the databases were evaluated, and in the second step, these data were analyzed and explained one by one in the software program. As a result of this research, the most commonly used keywords were “occupational health and safety”, “occupational health”, “Turkey”, “risk assessment”, “analytic hierarchy process”, “safety”, “agriculture”, “education”, “construction industry”, “occupational disease”, “occupational safety”, “risk analysis”, “work environment”, “curriculum”, “employees”, “evaluation”, “fahp”, “fmea”, “fuzzy”, “globalization”, “health and safety”, “health literacy”, “health promotion”, “learning styles”, and “hospitals”. As a suggestion for future research, it is possible to contribute to the literature in this article by establishing relationships with different disciplines (such as medicine, architecture, construction, design, health, and law) in publications on occupational health and safety. In this respect, it is essential to work with many different subjects in the occupational health and safety literature, to apply the research methodology to many fields, and to examine health, medicine, construction, and architecture as common subjects of different disciplines in terms of filling the gap in the literature. Another suggestion for future research is to analyze doctoral theses, master's theses, and only postgraduate publications in this field. Finally, this publication, which was prepared using the scientific mapping technique, can be made using another bibliometric analysis programs.

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The article complies with national and international research and publication ethics.

All authors contributed equally to the article

Ethics Committee approval was not required for the study

The Authors declare that there is not any conflict of interest about this paper.

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