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Authorship Collaboration and visualization on Detention Center Research: A Scientometric study

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Abstract

The present study examines the Authorship Collaboration and Visualization on Detention Center Research. In order to carry out the research, the related data were collected from “Web of Science” database. The data were analyzed and visualize using MS Excel and VOSviewer. The study covered the period from 1989 through the end of 2019. For this period, a total of 1311 records were published globally in the field of Detention Center research. The study also found that 95% of the literature in this area are scattered among English and other European languages. Holocausts, Trauma, Prevalence, Children, and Posttraumatic-stress-disorder are some of the keywords which is found to be associated with the discipline from the results.

Keywords: Authorship Collaboration, Detention Center, Scientometric, visualization

Introduction

Metrics are quantitative measurements which help to evaluate research outputs. Metrics studies help in understanding the productivity and growth of a discipline and assist in design and development appropriate policies for research and studies. There are different kinds of metrics available to study research outputs. Scientometrics is the process of measuring and analyzing research output data in the domain of science. Scientometric is concern with the qualitative features and characteristics of science and scientific research.

The study on the topic “Authorship collaboration and visualization on Detention Center research” is designed and carried out to examine the overall research productivity of “Detention Center” literature. The period of the study has chosen from 1989-2019. The data for the study have been downloaded from one of the most exhaustive and coveted bibliographic database, the Web of Science. Research outputs of the Detention center have been studied and analysed by using different metrics and statistical procedure in the study of scientometrics.

According to Merriam Webster Dictionary, a detention center is a place where people who have entered a country illegally are kept for a period of time. Detention is a term that is used to describe imprisonment, or the holding of an individual who has been accused of a crime. The use of the term detention varies significantly. For example, it can be used to refer to an individual who has been detained for interrogation, or it can be used to describe an individual who is being held in a detention facility, while awaiting a trial.

Review of literature

So far literature review conducted, preceding the preparation of this proposal no study has been done till date, so an urgent need has been felt for the study to know the contributions of the detention center in the domain of wide visibility at international level.

Galyani-Moghaddam (2019) scrutinized authorship pattern in the field of Psychology published by Iranian author and found Centrality Closeness of 16.63%, betweenness centrality of 6.64%, Clustering coefficient of 0.82 and Centrality degree 16.5%. Ghorbani, Zarrindast and Moradi were found to be most productive authors from Iran in the field of Psychology. Patil (2018) examined the thin films research output from India during 2000 to 2015 from the Scopus Citation database. Sivakumaren, Swaminathan and Karthikeyan (2019) examined the growth and development of publication output in the field of Cloud Computing during the year 2001-2010. The study revealed that 6.90% publications were published by the unknown institutions. Sudhier and Priyalakshmi (2013) examined on the research publication trends among the scientist of Central Tuber Crops Research Institute (CTCRI). The records considered for the study did not fit the Bradford's distribution pattern. Jeyshankar, Babu and Rajendran (2011) discussed the research publication of Central Electro Chemical Institute (CECRI) during the period 2000-2009. The highest degree of collaboration being 0.98 was found for the year 2005. Most of the articles were published by the *Bulletin of Electrochemistry*. Aswathy and Gopikuttan (2013) analyzed the publication pattern of faculty members of three university in Kerala viz., University of Kerala, Mahatma Gandhi University and University of Calicut during 2005 to 2009. The data were collected by consulting annual reports and websites of the concerned university.

Prasad and others (2016) studied on the research publication in the field of Himalaya during 1989-2014. The study revealed that India was the most productive country among top 10 most productive countries in Himalayan. Zafrunnisha and Pullareddy (2009) found

that 52.87% of total journal citations came from the multi-author papers and the degree of collaboration in psychology was 0.53. 94.56% of cited journal was in English Language and USA was the most producing 42.28% of cited journals. Elango and Rajendran (2012) in their paper Authorship Trends and Collaboration Pattern in the Marine Sciences Literature: A Scientometrics Study discussed about the authorship and collaboration pattern in the field of Marine Sciences Literature. 88.5% of the paper was contributed by the multi-author and the average collaboration rate has been observed in the year 2006. Sinha (2017) presented in his paper Scientometrics study of books authored by Nobel laureate Amartya Sen in economic science based on the books published by him during 1960-2015. Most of the books were translating in Italian language and the subject wise distribution most of the books belong to the social problem and services. Clarendon press was the highest productive publisher of the 9 books. Ali, Malik and Raza (2018) studied on Bibliometric analysis of literature on knowledge sharing using different bibliometric parameters. It was found that 44.33 % (1209) of the articles were published by the single institution and City University of Hong Kong, china was the most productive institute with 50 articles. Tripathi and Garg (2016) analyzed the research publication output in the field of cereal crop in India and found that collaborated by the multi-authored (two or more than two authors). Rahul and Nishy (2016) discussed on the research output of the Mycobacterial tuberculosis and leprosy in India. For the study the data was collected from the Web of Science database during the period of 1987 to 2012. All India Institute of Medical Sciences, New Delhi was the most productive institution. Low and others (2013) discussed on the international research collaboration and authorship trend in clinical medicine published by Malaysia during 2001 to 2010 with the collaboration of the other countries USA and Great Britain was the most collaborated country. Verma and Singh (2019) conducted the bibliometrics study on Food Security in India during the period from 2000-2018 and the data was downloaded from Web of Science. USA was the most collaborated country with India compares to the others countries.

Objectives of the study

- 1) To study the global research output with citation impact.
- 2) To analyze the various form and language distribution of publication.
- 3) To identify the country-wise distribution of publication.
- 4) To examine the pattern of citation of the research output and to identify highly cited paper.

- 5) To build country and authorship network visualization using VOSviewer.
- 6) To build keyword Co-occurrences map and keyword growth analysis using VOSviewer

Methodology

The publication data on Detention center was retrieve from the Web of Science database of Thomson Reuters and presently maintained by the Clarivate Analytics. There were 1331 documents were found during 1989 to 2019. To find out the relevant data of detention center, the following search strategy was used in the WoS core collection: TS= ("detention centers" OR "borstal" OR "detention home" OR "house of detention "OR "reform school" OR "reformatory" OR "concentration camp").

MS Execl and VOSviewer software were used for data analysis and visualizing the collected dataset. VOSviewer are mainly used for visualizing the different collaboration network and co-occurrences network.

Data Analysis

Document wise distribution:

Table 1 shows the type of documents being published under the Detention Canter research out of which maximum 908 documents are published in the form of Articles which is 69.26% followed by Reviews 334 (25.48%) and Editorial Material 29 (2.21%). The remaining 3.05% of literature distributed in documents such as Meeting Abstract, Biographical, Letter, Poetry, News Item, Correction, Note, Bibliography, Reprint, and Miscellaneous. An increasing trend in all the type of documents is observed in Detention Center Research.

Table 1: Type of Document wise distribution

Type of documents

Sl. No.	Period	Article	Review document	Editorial Material	Meeting Abstract	Biographical	Letter	Poetry	New Items	Correction	Note	Bibliography	Reprint	Misc.	Total
	1980 to 1990	15 (1.14)	6 (0.46%)	1 (.08%)	0	0	0	1 (.08)	0						23
2	1991 to 2000	158 (12.05)	121 (9.23%)	4 (.31%)	1(.08)	2(.15)	2 (.15)	2 (.15)	0	2(.15)	1 (.08)	1 (.08)	1 (.08)		295
3	2001 to 2010	302 (23.04%)	117 (8.92%)	9 (.69%)	2(.15)	4(.31)	3 (.23)	1 (.08)	4 (.31)	1(.08)					443
4	2011 to 2019	433 (33.03%)	90 (6.86%)	15 (1.14%)	7(.53)	1(.08)	1 (.08)	2 (.15)	1 (.08)						550
Total		908 (69.26%)	334 (25.48%)	29 (2.21%)	10(.76)	7(.53)	6 (.46)	6 (.46)	5 (.38)	3(.23)	1 (.08)	1 (.08)	1 (.08)	2 (.15)	1311

Distribution of publication by language:

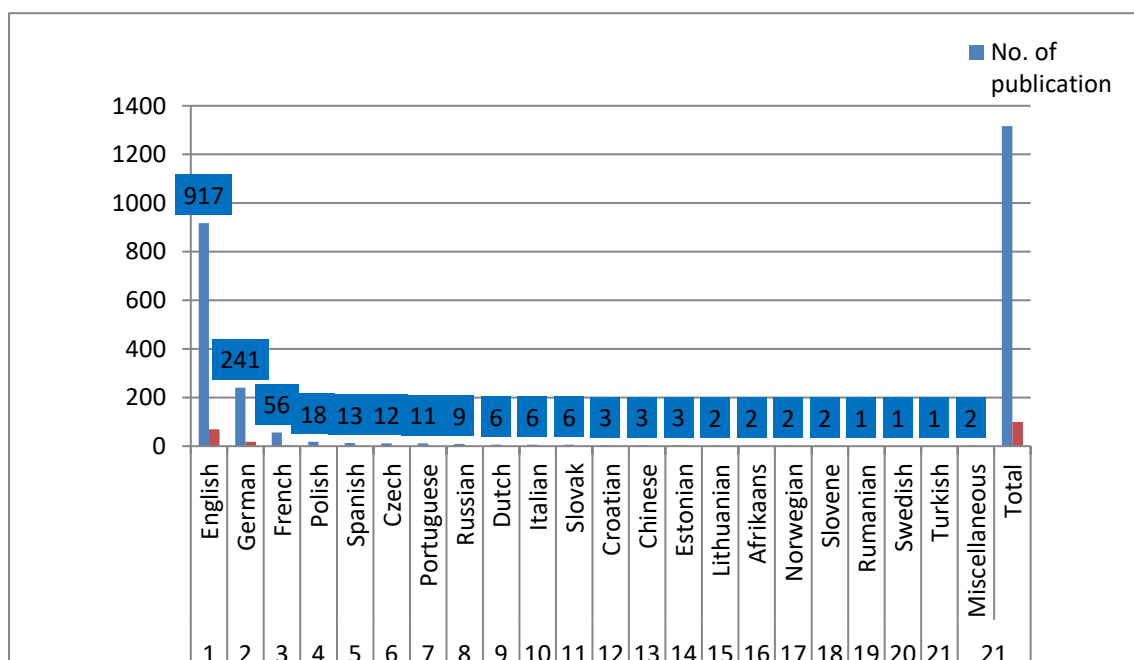


Figure 1: distribution of publication by language

From figure 1 it is found that maximum 917 of the publications is published in English language 69.62% followed by German and French of 241 (18.29%) and 56 (4.25%) publications. Remaining 7.82% of publications are published in other types of language such as, Polish, Spanish, Czech, Portuguese, Russian, Dutch, Italian, Slovak, Croatian, Chinese, Estonian, Lithuanian, Afrikaans, Norwegian, Slovene, Rumanian, Swedish, Turkish, and Miscellaneous.

Year-wise Publication and Citation:

Table 2 shows that the block-wise year publications and citations of Detention Center Research. In the study we found that 314 (23.84%) of the publications were published in the period of 2015 to 2019 followed by 2010 to 2014 with 297 (22.55%) and 2005-2009 with 207(15.72%). From the table we found that total 8049 citation was found out of 1311 records during the period 1989-2019. The average citation per document received in this research is 6.14%. In between 1995 to 1999 has the less citation impact compare to others blocks.

Table 2: Year-wise Publication and Citation

Block wise Year of Publications and Citations					
Sl. No	Period	No of Document	TP	TC	ACPD
1	1989-1994	116	8.81	1019	8.78
2	1995-1999	165	12.53	805	4.88
3	2000-2004	212	16.10	1745	8.23
4	2005-2009	207	15.72	1995	9.64
5	2010-2014	297	22.55	1809	6.09
6	2015-2019	314	23.84	676	2.15
Total		1311		8049	
TP=Total Percentage, TC= Total Citations, ACPD= Average citation per Documents					

Table 3 discusses about the top 10 most collaborated countries and their citation, USA produced majority of 31.66% (417) publication on Detention Center with 4564 citations followed by GERMANY 7.06% (93) publications and 361 citations, ENGLAND 6.07% (80) publications and 617 citation, POLAND 3.04%(40) publications with 100 citations, CANADA 2.89%(38) publications with 347 citations, and Netherlands 2.43%(32) with 356 citations, Australia 2.35%(31) with 410 citations. France 2.28 %(30) with 349 citations, Israel 2.20%(29) with 308 citations and Spain 1.75%(23) with 133 citations.

Table 3: Top 10 most productive countries and their citations

County wise collaboration and citation					
Sl. No	Country	No of Documents	TP	TC	ACPD
1	USA	360	27.33	4564	12.68
2	Germany	93	7.06	361	3.88
3	England	80	6.07	617	7.71
4	Poland	40	3.04	100	2.50
5	Canada	38	2.89	347	9.13
6	Netherlands	32	2.43	356	11.13
7	Australia	31	2.35	410	13.23
8	France	30	2.28	349	11.63
9	Israel	29	2.20	308	10.62
10	Spain	23	1.75	133	5.78
TP=Total Percentage, TC= Total Citations, ACPD= Average citation per Documents					

Distribution of publication by Number of Authors:

Here to know the Distribution of publication by Number of Authors, the whole records are divided into single, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, and thirteen. The result are presented in table 4 shows that most of the publication was came from single author of 66.21% (873) publication are published followed by two author of 10.10%(133) publication and the remaining 23.69% of publication are published by three or more than three author.

Table 4: Authorship pattern

Numbers of Documents published by number of authors			
Sl. No.	No of Author	No of Document	Total Percentage
1	Single Author	873	66.29
2	Two Author	133	10.10
3	Three Author	87	6.61

4	Four Author	74	5.62
5	Five Author	44	3.34
6	Six Author	33	2.51
7	Seven Author	24	1.82
8	Eight Author	28	2.13
9	Nine Author	10	0.76
10	Ten author	5	0.4
11	Eleven author	1	0.076
12	Twelve author	4	0.30
13	Thirteen author	1	0.08
Total		1317	100.00

Degree of collaboration

The extent of collaboration in research can be measured with the help of multi authored papers using the formula given by K. Subramaniyam (1983) is used. The Formula is:

$$\text{Degree of collaboration, } C = \frac{Nm}{Nm+Ns}$$

Where, C = Degree of collaboration, Nm = Number of Multi authored papers, Ns = Number of Single authored papers.

Table 5: Degree of Collaboration

Sl. No.	Period	SA	%	MA	%	Total	DC
1	1980 to 1990	19	82.61	4	17.39	23	0.17
2	1991 to 2000	226	76.61	69	23.39	295	0.23
3	2001 to 2010	307	69.30	136	30.70	443	0.31
4	2011 to 2019	315	57.27	235	42.73	550	0.43
Total		867	65.83	444	33.71	1311	

SA= Single Author, MA= Multi Author, DC= Degree of collaboration

The DC for the block (1989 to 1990) is found to be 0.17; the DC for (1991 to 2000) is 0.23; DC for (2001 to 2010) has been calculated as 0.31 and the final study period (2011 to 2019) is greater than first, second and third block with 0.43 as the DC. An increasing trend in DC is observed from the data in the field of Detention Center research.

Distribution of Publication in the Journals

Table 5 show the distribution of publication of top 10 most productive journals, out of 1311 publication 46 (3.49%) publication have been published by “ZEITSCHRIFT FUR GESCHICHTSWISSENSCHAFT journal” followed by HISTORISCHE ZEITSCHRIFT journal with 22 publications, ZEITGESCHICHTE 22(1.67%), HOLOCAUST AND GENOCIDE STUDIES 21(1.59%), GERMAN STUDIES REVIEW 13(0.99%).

Table 6: Distribution of publication in Top 10 journals

Source of documents			
Sl. No.	Journals name	No. of item	percentage
1	ZEITSCHRIFT FUR GESCHICHTSWISSENSCHAFT	46	3.49
2	HISTORISCHE ZEITSCHRIFT	22	1.67
3	ZEITGESCHICHTE	22	1.67
4	HOLOCAUST AND GENOCIDE STUDIES	21	1.59
5	GERMAN STUDIES REVIEW	13	0.99
6	PSYCHE-ZEITSCHRIFT FUR PSYCHOANALYSE UND IHRE ANWENDUNGEN	10	0.76
7	TEKSTY DRUGIE	9	0.68
8	BEITRAGE ZUR GESCHICHTE DER ARBEITERBEWEGUNG	8	0.61
9	JOURNAL OF TRAUMATIC STRESS	8	0.61
10	SEXUALLY TRANSMITTED DISEASES	8	0.61

Countries Collaboration Networks

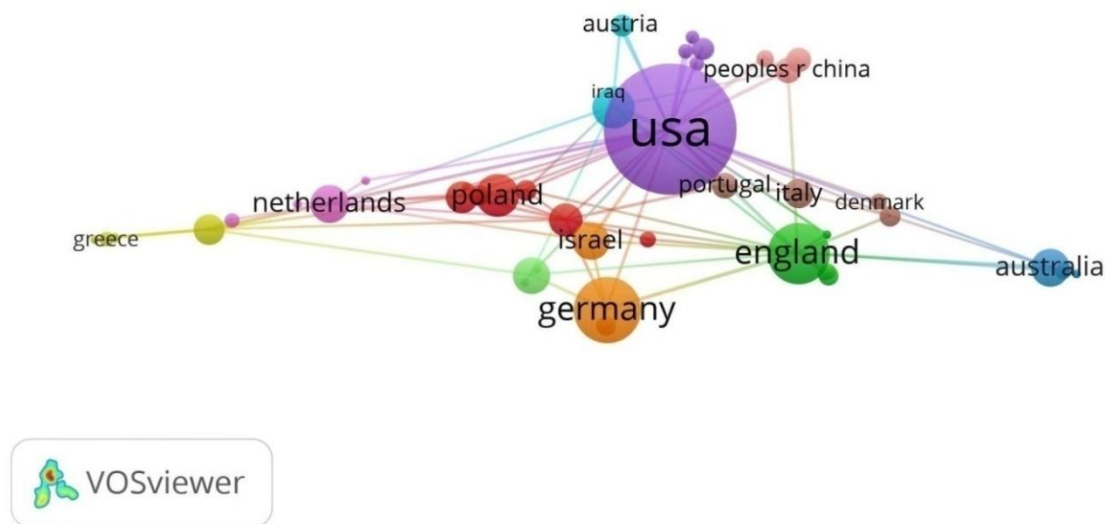


Fig 2: Collaboration Network of all 50 countries

Each node represents country's productivity and the link between the countries denotes the collaboration established through the authorship in the articles. The highly productive countries in terms of publication and productivity are USA (publication= 360, citation= 4564) followed by England (publication=80, citation=617), Netherlands (publication=32, citation=356), Canada (publication=38, citation=347), Belgium (publication=20, citation=115).

The entire 50 item are divided into 11 clusters and each cluster is represented by different colors.

Table 7: Top 10 Countries associated with the strongest publication burst

Sl. No.	Rank	Country	Documents	Citations	Total Link Strength
1	1	USA	360	4564	65
2	2	England	80	617	25

3	3	Netherlands	32	356	20
4	4	Canada	38	347	17
5	5	Belgium	20	115	16
6	6	Germany	93	361	13
7	7	Spain	23	133	13
8	8	Peoples r china	15	166	9
9	9	Portugal	15	72	9
10	10	France	30	349	8

Authorship Network

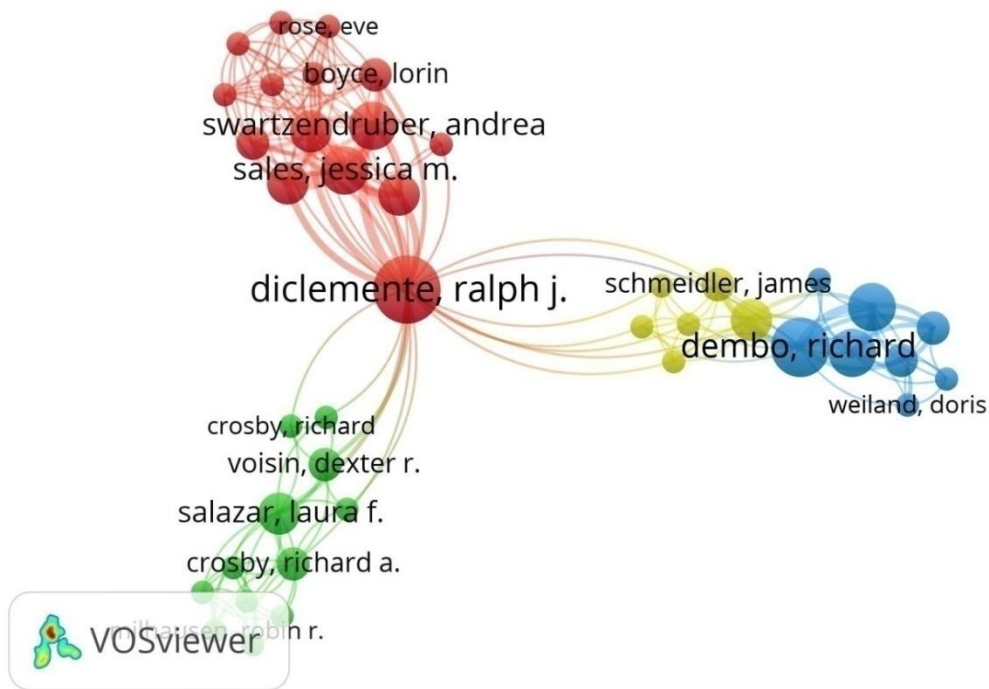


Fig 3: Authors Collaboration Network

In this figure shows the visualization of the author collaboration networks. The networks were formed by those authors who had published at least 1 document related to the detention center. The network contains 41 items 191 links and 4 clusters. Each node represents authors productivity and the link between the authors donate collaboration established through the co-authorship in the documents. The highly productive authors in terms of publication and productivity are Relph J. Dielements with 8 documents and 48 citations as well as 43 total link strength followed by Pedro Pecharro (documents-7,

citations-25, and total link strength-24), Richard Dembo (documents-6, citations-162, and total link strength-25), Cristina Nunes (documents-6, citations-33, and total link strength-23), Robert Vermeiren (documents-6, citations-95, and total link strength- 28)

Each of the size of the circles represents the author productivity and the thickness of the line represents the collaboration amongst the authors. Each clusters are represent by different colors.

Table 8: Top 10 Authorship Collaboration Network

Sl. No	Rank	Author	Documents	Citations	Total link strength
1	1	Diclemente, ralph j.	8	48	43
2	2	Pechorro, pedro	7	41	24
3	3	Dembo, Richard	6	162	25
4	4	Nunes, cristina	6	33	23
5	5	Vermeiren, Robert	6	95	28
6	6	Aalsma, matthew c.	5	43	13
7	7	Colins, olivier f.	5	43	22
8	8	Kamarulzaman, adeeba	5	45	22
9	9	Manninen, marko	5	61	23
10	10	Altice, frederick l.	4	21	22

Keyword Co-occurrence analysis

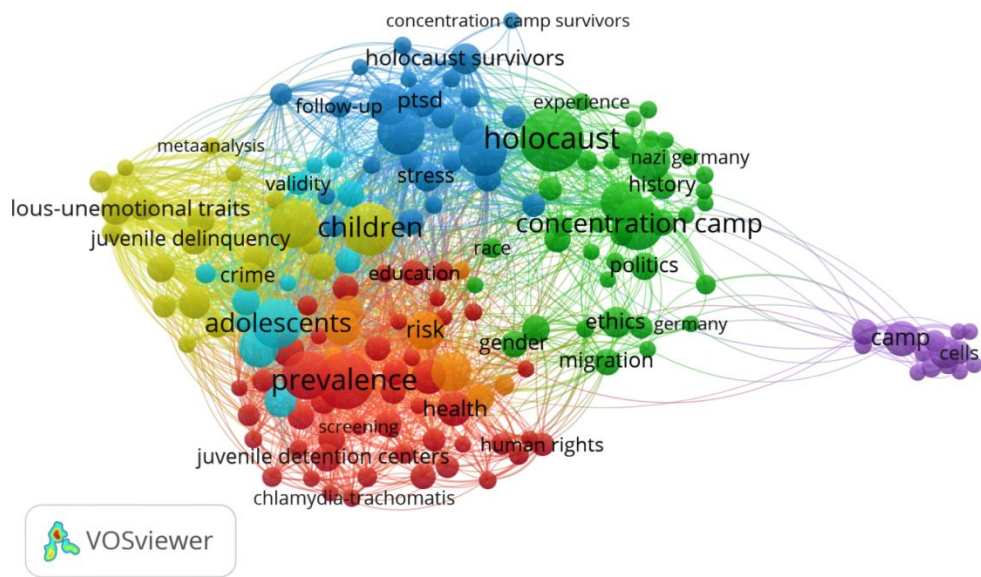


Fig 4: Keyword Co-occurrence

Figure 4 displays the visualization of the Keyword Co-occurrence networks of this domain. The threshold frequency was taken as 5 for Keyword Co-occurrence as derived by VOSviewer. Out of 3430 keywords, 169 meet the threshold frequency. Table 7 shows that a list of top 20 most occurred keyword used in Detention center research. Holocaust is the most occurred keyword with the frequency of 47 and total link strength of 100 followed by Prevalence (occurrence-40, total link strength-204), Children (occurrence-34 total link strength- 161), Adolescents (occurrence-33 total link strength-40), Concentration camp (occurrence-31 total link strength-171).

Table 9: Top 10 Keyword Co-occurrence

Sl. No	Rank No	Keyword	Occurrences	Total link strength
1	1	Holocaust	47	100
2	2	Prevalence	40	204
3	3	Children	34	161
4	4	Concentration camp	33	40
5	5	Adolescents	31	171
6	6	Violence	30	135
7	7	Youth	30	137

8	8	Posttraumatic-stress-disorder	29	151
9	9	Trauma	29	103
10	10	Concentration camps	24	32

Author keywords and Keyword plus:

Table 8 explain the most relevant top 10 author keywords and keywords plus. Keywords co-occurrence analysis has also been conducted using VOSviewer technique by importing the roa file and generating the map as shown Figure 5 & 6.

Table 10: Top 10 author keyword and keyword plus

Sl. No.	Rank No	Author Keyword	Occurrences	Total link strength	Keyword Plus	Occurrences	Total link strength
1	1	holocaust	39	46	prevalence	38	140
2	2	concentration camp	33	46	children	29	101
3	3	concentration camps	24	32	posttraumatic-stress-disorder	29	109
4	4	trauma	21	43	youth	25	96
5	5	adolescents	17	27	concentration-camp survivors	24	73
6	6	camp	15	6	psychiatric-disorders	22	100
7	7	juvenile justice	14	14	risk	21	71
8	8	detention	13	34	violence	19	65
9	9	juvenile delinquency	13	20	behavior	18	57
10	10	memory	13	21	women	17	20

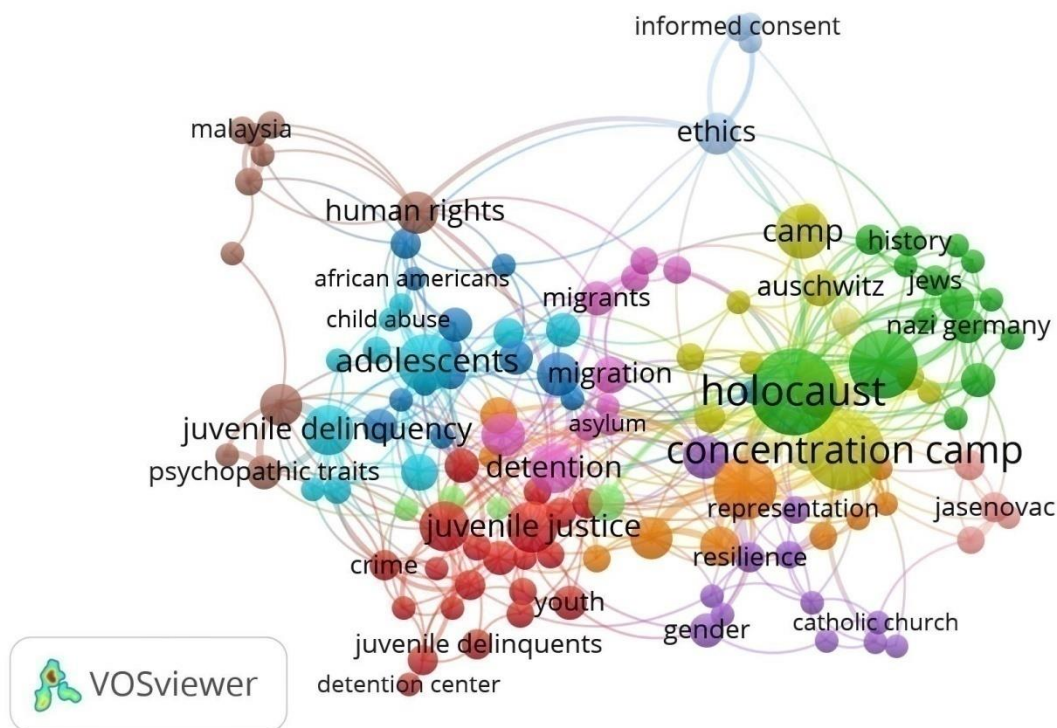


Figure 5: Author Keywords Networks

Figure 5 shows the visualization of Author Keywords using VOSviewer. The minimum number of occurrences of keywords is taken as 3. Out of the 2065 keywords, 134 meet the threshold. Some of the 134 items in the Network are not connected to each other. The largest set of connected items consists of 131 items. The Networks is consists of 131 items, 13 clusters, 496 links and total link strength. This 131 items distributed over thirteen Clusters: cluster-1(21), cluster-2(15), cluster-3(14), cluster-4(12), cluster-5(12), cluster-6(11), cluster-7(10), cluster-8(10), cluster-9(10), cluster-10(4), cluster-11(4), cluster-12(4), and cluster-13(4).

For each of the 131 keywords the total strength of the co-occurrence links with other keywords will be calculated. The keywords with the greatest total link strength will be selected.

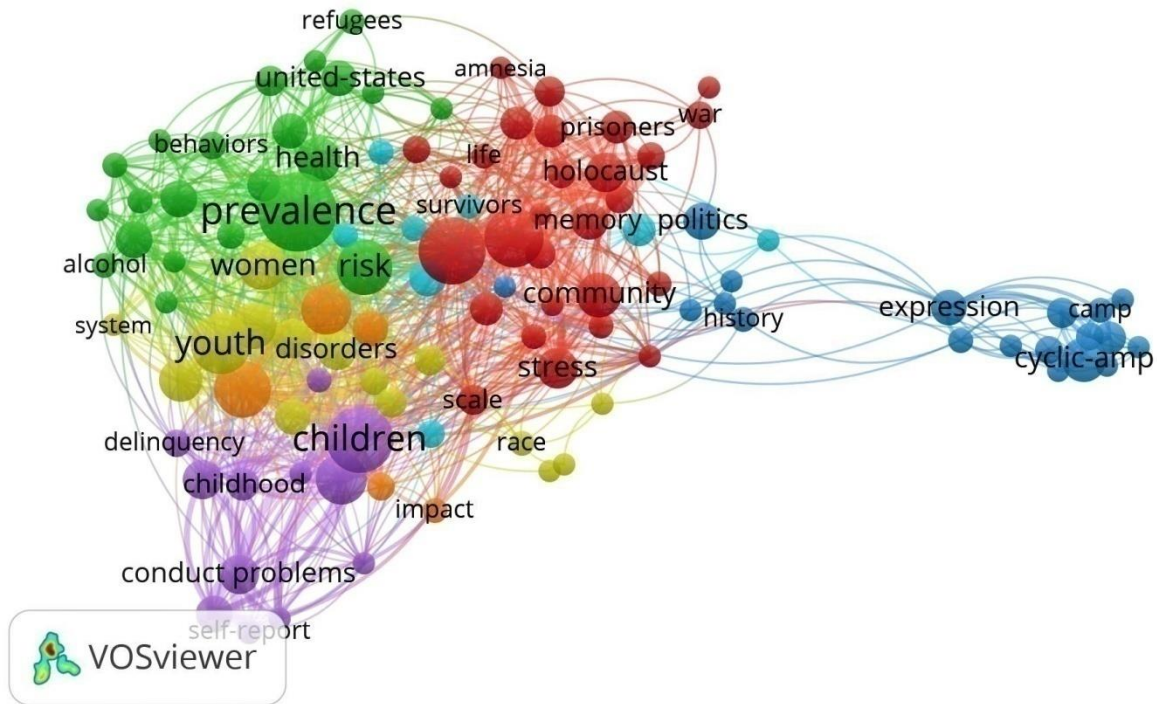


Figure 6: Keywords Plus Networks

The threshold frequency was taken as 5 for keyword plus as derived by VOSviewer. The networks contains of 109 keywords, 1008 co-occurrence links and 7 clusters. As can be seen in the map, nodes such as Prevalence, Children, Posttraumatic-stress-disorder, Youth, Concentration-camp survivors, Psychiatric-disorders, Risk, Violence, Behavior, Women, Adolescents, Community, Cyclic-amp, Health, Abuse, Stress, Antisocial-behavior, Conduct problems, Disorders, Holocaust have the highest frequency of occurrence.

Discussion

Analysis shows that the highest number of publications in the Detention center research was published during the period of 2015 to 2019 and the highest number of citations receives during the period of 2005 to 2009. Most of the documents were published in English language and 69.25 of the documents were published in form of Articles. The authorship pattern analysis reveals that multi-authored papers are dominant in this area of study. The Degree of Collaboration shows that there was an increasing trend of single authored papers and a decreasing trend in multi authored papers and the highest number of degree of collaboration has been calculated in the period of 2011 to 2019. Among the countries USA published the highest number of documents.

Table 6 of the study revealed that Detention Center research is published journals belonging to different disciplines such as History, Psychoanalysis, Dugs, Traumatic Stress, Sexually Transmitted diseases. Table 7 shows that USA and England are actively pursuing research on Detention Centers. From the Keyword Co-occurrences study , it is revealed that Detention Center literature deals with concepts related to holocaust, Trauma, Prevalence, Children, Posttraumatic-stress-disorder, Youth, Concentration-camp survivors, Psychiatric-disorders, Violence against Women and children, Adolescents, Community, Cyclic-amp, Health, Abuse, Stress, Antisocial-behavior among children, etc.

Conclusion

A comprehensive Scientometric study on Detention Center research has been performed through Clarivate Analytics Web of Science database during the period of 1989 to 2019. It has been observed from the study that India contributes only 0.30% in the Detention Center research. The study shows how stress, abuse, Violence against Women and children, juvenile delinquency are to be some of the most occurred keywords in the discipline. The study also found that 95% of the literature in this area are scattered among English and other European languages such as German, French, Polish, Spanish and Czech. No significant contribution from India is found in the area of Detention Center research.

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