Review Article

Bibliometric Analysis of Indian Journal of Palliative Care from 1995 to 2022 using the VOSviewer and Bibliometrix Software

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ABSTRACT

Introduction: The Indian Journal of Palliative Care (IJPC) is an open-source, interdisciplinary and peer-reviewed journal started in 1994 that publishes high-quality articles in the field of palliative care in India. The purpose of this study is to analyse the bibliometric data of its publications using bibliometric analysis to understand the key bibliometric factors affecting the journal and its contribution to the field of palliative care research.

Material and Methods: A software-assisted bibliometric analysis of the IJPC was conducted. The dimensions database was used to mine the bibliometric data of the journal from 1995 to 2022. A total of 1046 records were analysed using the VOSviewer and Biblioshiny by Bibliometrix software.

Results: The analysis represented a vivid and graphically elaborate picture of the journal. It gives insight into the most productive and influential authors, countries, affiliations, sources and documents along with a picture of the network among them.

Conclusion: This study highlights a gradual upward trend in the annual production of the journal. A strong connection of the IJPC could be seen with leading journals publishing in the field of palliative care globally.

Keywords: Bibliometrics, Visual mapping, VOSviewer, Single journal study, Indian journal of palliative care

INTRODUCTION

The Indian Journal of Palliative Care (IJPC), started in 1994, is an open-access, interdisciplinary and peer-reviewed journal that publishes high-quality articles in the field of palliative care quarterly.[1] Owned by the Indian Association of Palliative care and published by scientific scholar, the journal is indexed by PubMed Central, SCOPUS, Emerging Sources Citation Index, Indian Science Abstracts and Scimago Journal Ranking.[1] At present, the editorial comprises Dr. Raghavendra Ramanjulu as the editor.[1] Considering the IJPC is the only impact factor journal dedicated to research in palliative care and its multidisciplinary fields in India, it becomes of special interest for the bibliometric analysis. The method is a mathematical and statistical approach to analyse bibliographic data of books, journals and scientific papers.[2] It gives an insight into the emerging trends in a particular area of research, research themes, journal performance, research constituents and collaboration networks.[3] The bibliometric study could be used to analyse the publication patterns of written communication in a specific field of research including data from multiple sources or it could be a single journal study. However, single journal studies, in particular, contribute insights into the productivity and quality of the journal in a specific field, providing a detailed multifaceted picture of the characteristics of the journal.[4,5] Single journal studies using the bibliometric approach have been applied to other disciplines such as humanities, health and medicine, science and technology library sciences, economics and management studies.[5]

Since the IJPC is significant to the field of palliative care research, specifically in India, the analysis is essential to increase understanding of the research activity in the area. Hence, to understand the research trends of palliative care research in India from various bibliometric indicators and to gain insights into the top contributors in the field, an in-depth analysis of the journal's bibliometric properties is required. The analysis also becomes significant considering

no single journal bibliometric analysis or scientific mapping could be found of the IJPC through the literature review to the best of our knowledge.

OBJECTIVES OF THE STUDY

The main objective of the study is to conduct a bibliometric analysis and scientific mapping of the IJPC. The study would cover the following analysis:

- Data analysis of the publication output
- Citation analysis
- Authorship analysis
- Network analysis among documents, authors, affiliation, text and countries along with bibliometric coupling
- Identifying major research trends through a multiphasic study.

METHOD AND MATERIALS USED

This study focuses on the bibliometric analysis of publications by the IJPC. Donthu *et al.* in their paper, '*How to conduct a bibliometric analysis: An overview and guidelines.*' Have proposed a four-step procedure for conducting bibliometric analysis?[6] The steps include: (1) Define the aim and scope of the bibliometric study, (2) choose the technique, (3) collect the data and (4) run the bibliometric data and report findings. This research is in line with the suggested four-step procedure. The *Dimensions* database was used to extract data for the bibliometric analysis. The *Source Title* was limited to the 'Indian Journal of Palliative Care (IJPC),' whereas the *Publication type* was limited to 'Articles.' A total of 1049 records from the year '*2005 to 2022*' (last accessed on January 19, 2022) were downloaded in CSV format. The exported data were then run in the selected software. For our analysis, we used the VOSviewer and Bibliometrix software.

Biblioshiny app by Bibliometrix is an open-source, R tool that requires no coding for the analysis of data.[7] Following analysis of the IJPC data was done through the Bibliometrix software.

- Dataset analysis
- Citation analysis
- Authorship analysis
- Conceptual structure and thematic analysis.

VOSviewer is open-source software that creates and represents network visualisation maps.[8] The software was primarily used to create network maps and relationships between the bibliometric data. The software employs a technique that helps the users construct and view distance-based maps in which the distance between two items reflects the strength and relationship between the selected items. Following analysis of the IJPC data was run through the VOSviewer software.

- Cocitation network
- Coauthorship network
- Bibliographic coupling
- Cooccurrence map based on text data.

DATA ANALYSIS AND FINDINGS

In this study, 1049 articles were identified and extracted from the dimensions database. The extraction included all the articles published between 2005 and 2022.

Data set analysis

[Table 1] represents the main information about the data collected, while [Table 2] represents the annual scientific production of the journal. In the beginning year 2005, a total of 25 articles were published, the number decreasing to 14 in the year 2007 but after that, there was a gradual and steady rise in the number of articles published. Years 2018–2021 were the highest productive years of IJPC, whereas in the year 2020, maximum articles were published; 150 articles in total. A total of 2356 articles were published in the journal among which, 133 were single-authored documents and 2223 were multi-authored documents.

[Table 2 and Figure 1] represent the annual scientific production of the journal. A steady and upward trend in the annual scientific publication of the journal could be seen through the graphical representation in [Figure 1].

Sources analysis

An analysis of locally cited sources reported that a total of 2761 sources were cited in the IJPC. [Table 3] represents the top 20 locally cited sources; sources that were cited within the

Table 1: Main information of data collected (analysis done using bibliometrics).

Description	Results
Main information about the Indian Journal of Palliative Care	
Timespan	2005:2022
Sources (Journals, Books, etc.)	1
Documents	1049
Average years from publication	6.24
Average citations per document	6.308
Average citations per year per doc	0.782
References	15085
Document types	
Article	1049
Document contents	
Keywords plus (ID)	1
Author's keywords (DE)	1
Authors	
Authors	2356
Author Appearances	3923
Authors of single-authored documents	133
Authors of multi-authored documents	2223
Authors collaboration	
Single-authored documents	203
Documents per author	0.445
Authors per document	2.25
Coauthors per documents	3.74
Collaboration Index	2.68

IJPC, whereas [Figure 2] is the graphical representation of the top 20 locally cited sources. *Journal of Pain and Symptom Management* is the most cited source in the cited references of articles published in IJPC, cited in 748 articles, followed by the *Indian Journal of Palliative Care* itself, locally cited in 680 articles and journal of Clinical Oncology and Palliative Medicine cited in 428 and 426 articles, respectively.

Authorship analysis

[Figure 3] represents the top 20 most relevant authors in IJPC. Most relevant authors refer to the authors with the highest number of articles published in the journal. As represented in [Figure 3], Bhatnagar S ranks first with a total count of 113 publications followed by *Salins N* contributing 46 publications and Mishra S with a total of 33 publications. In line with top authors, [Figure 4] represents the top 20 author's

production over time in terms of the number of publications and citations per year. The bubbles represent the number of articles published by a particular author in a given period. The darker and bigger the bubble is in a particular timeline, the most productive the author had been that year. [Figure 4] suggests that the year 2020 had been the most productive for most of the authors.

[Table 4] represents the 20 top authors with the number of publications, and total citations according to h-index, g-index and m-index. The h-index is an author-level metric that measures the author's production and citation impact whereas the m-index is the h-index divided by the active years of a particular author.

[Figure 5] suggests the top 20 relevant affiliations. *All India Institute of Medical Sciences* (AIIMS) is the top relevant affiliation with a total of 97 articles published in IJPC by different authors followed by *TATA memorial hospital* with
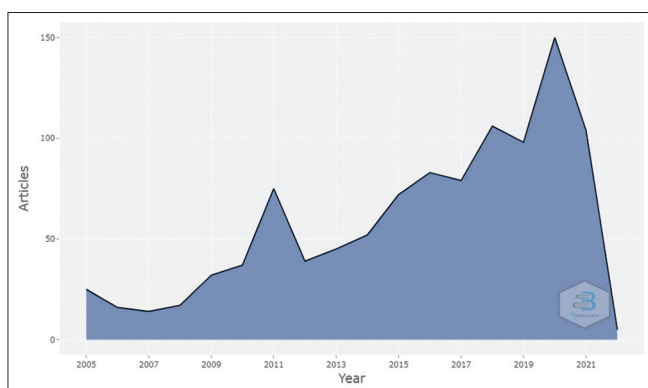

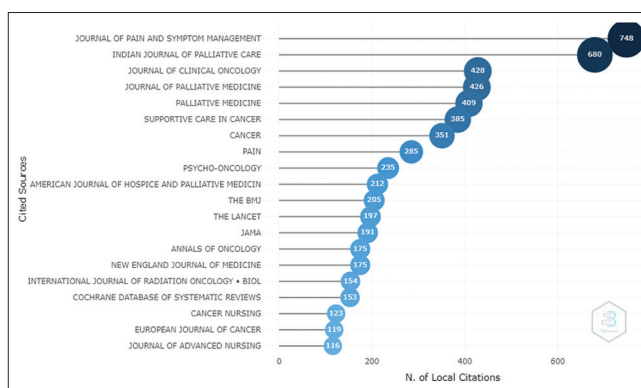**Figure 1:** Annual scientific production (analysis done through Bibliometrix software).

Figure 2: Graphical representation of most local cited sources.

Table 2: Annual scientific production (analysis done through Bibliometrix software).

Year	Articles
2005	25
2006	16
2007	14
2008	17
2009	32
2010	37
2011	75
2012	39
2013	45
2014	52
2015	72
2016	83
2017	79
2018	106
2019	98
2020	150
2021	104
2022	5

Table 3: Most local cited documents.

Sources	Articles
Journal of pain and symptom management	748
Indian journal of palliative care	680
Journal of clinical oncology	428
Journal of palliative medicine	426
Palliative medicine	409
Supportive care in cancer	385
Cancer	351
Pain	285
Psycho-oncology	235
American journal of hospice and palliative medicine®	212
The BMJ	205
The LANCET	197
JAMA	191
Annals of oncology	175
New England journal of medicine	175
International journal of radiation oncology • Biology • Physics	154
Cochrane database of systematic reviews	153
Cancer nursing	123
European journal of cancer	119
Journal of advanced nursing	116

a count of 90 documents and *DR. B.R. Ambedkar Institute Rotary Cancer Hospital* with a count of 52 documents.
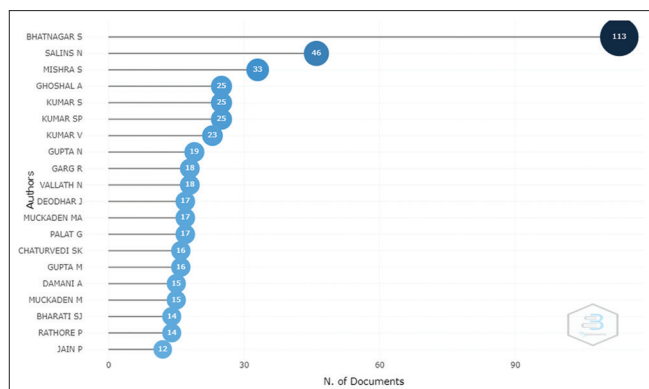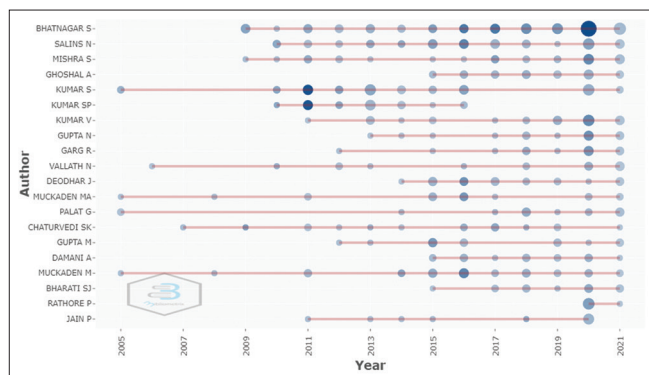

Figure 3: Most relevant author.

Figure 4: Top author's production over time.

[Table 5] suggests the corresponding author's country's scientific production. India, Iran and the UK are the top 3 countries with the most scientific productions, the number of documents being 843, 146 and 44, respectively, whereas, [Table 6] suggests the most cited countries. [Figure 6] is the graphical representation of [Table 5].

Citation analysis

[Table 7] represents the top 20 globally cited documents, with the paper by Khosla *et al.*, named *Palliative Care in India: Current Progress and Future Needs*, published in the year 2012 being cited 81 times globally,[9] followed by Chaturvedi *et al.*[10] cited 76 times and Narayan *et al.* (2010) cited 72 times.[11-28]

Research trends

Studying the research trends of a particular journal help researchers and the general readers of the publication identify the key areas of interest in a particular field of research. It gives an insight into research themes explored over the given years, helping scholars to track and trace these research trends and contribute further to the research field.

To understand the key areas of research and major themes, the bibliometric data were divided into three phases based on the year of publication. Phase I covered the publications from the year 2005 to 2010, Phase II covered the publications from the year 2011 to 2016 and Phase III covered the publications from the year 2017 to 2022 (till January 2022).

Phase I (2005–2010)

A total of 141 articles were published during this phase. Conceptual structure analysis using the Bibliometrix

Table 4: Top 20 authors.						
Element	h_index	g_index	m_index	TC	NP	PY_start
Bhatnagar S	12	17	0.857	477	78	2009
Kumar SP	9	17	0.692	327	21	2010
Mishra S	7	11	0.5	152	26	2009
Rassouli M	7	8	0.778	169	8	2014
Salins N	7	12	0.583	214	32	2011
Chaturvedi SK	6	13	0.375	186	13	2007
Kumar S	6	9	0.333	109	18	2005
Muckaden M	6	9	0.5	105	15	2011
Rao RM	6	6	0.75	100	6	2015
Deodhar J	5	8	0.625	79	11	2015
Garg R	5	6	0.455	54	12	2012
Ghoshal A	5	5	0.625	61	17	2015
Gupta M	5	6	0.455	69	6	2012
Kulkarni P	5	5	0.556	128	5	2014
Mohanti BK	5	5	0.357	86	5	2009
Muckaden MA	5	10	0.278	109	14	2005
Patil S	5	5	0.625	94	5	2015
Rahmani A	5	5	0.556	79	5	2014
Ahmed A	4	7	0.333	69	7	2011
Atreya S	4	6	0.571	39	6	2016
*Note: TC: Total citation, NP: Number of publication, PY: Publication year						
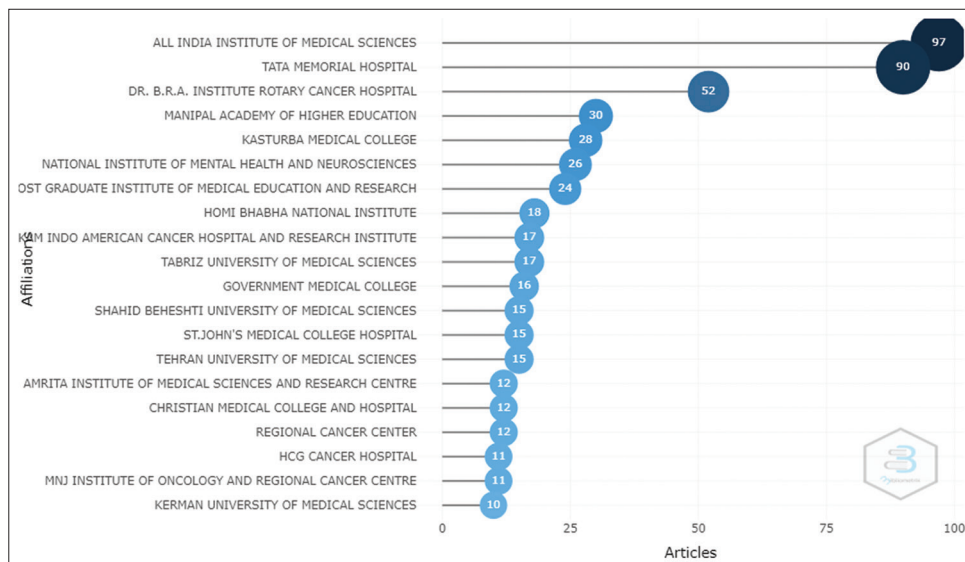
Figure 5: Most relevant affiliations.

Table 5: Country Scientific production.

Region	Freq
India	843
Iran	146
UK	44
Australia	27
Canada	25
Sweden	20
Italy	19
Japan	15
Turkey	15
Greece	13
Egypt	12
Indonesia	12
Saudi Arabia	12
Malaysia	10
Nigeria	10
Singapore	10
South Africa	6
China	5
Colombia	5
Germany	5

Table 6: Most cited countries.

Country	Total citations	Average article citations
India	3573	5.867
Iran	917	12.392
Na	906	5.491
United Kingdom	169	7.042
United States	115	4.423
Nigeria	93	18.6
Canada	90	9
Nepal	77	38.5
Australia	73	6.636
Belgium	62	15.5
Jordan	52	26
Singapore	50	8.333
Indonesia	43	5.375
Morocco	39	19.5
Italy	38	4.75
New Zealand	29	9.667
Thailand	29	9.667
Japan	27	3.857
Malaysia	25	2.778
Pakistan	24	12

software was done to create a thematic map of the research trends during this phase. The parameter was set to 'Author's Keywords' where trends were identified through the frequency of occurrence of a keyword. The frequently occurring themes during this phase were palliative care research in quality of life, cancer pain, pain, community home-based program, breaking bad news and communication among others. [Table 8] represents the thematic map data.

Further, a thematic map was created to understand the major themes dividing them into the quadrants of four themes:

Basic, motor, niche and emerging themes. The parameter was again set to research keywords as given by authors.

- Basic Themes: Basic themes identified were cancer pain, palliative radiotherapy, oral morphine, quality of life and rehabilitation. Euthanasia and awareness were covered to some extent as well
- Motor Themes: Motor themes identified were cancer, communication, breaking bad news and oncology
- Niche Themes: Niche themes identified were HIC/AIDS, community-based care programs and caregiving.
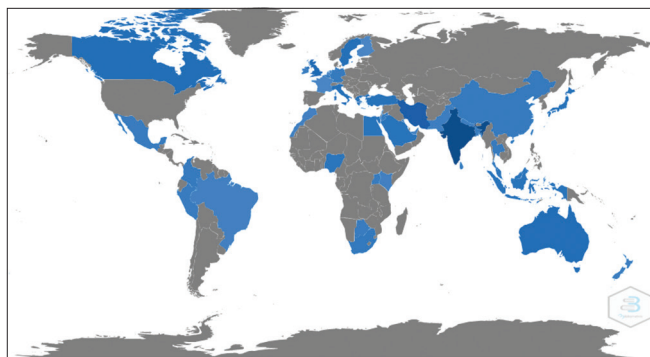
Figure 6: Country's scientific production.

- Emerging Themes: Emerging themes during this phase were chemotherapy and radiotherapy.

[Figure 7] represents the thematic map of the themes during this period.

[Figure 8] represents the word cloud generated out of the published titles in the journal during this phase exploring the major themes through the titles of the research.

Phase II (2011–2016)

Publications were significantly increased with a total of 366 documents published during this phase. A frequency trend of research topics through the author's keywords was analysed

Table 7: Top 20 Globally cited documents.

Paper	Document	Total citations	TC per Year	Normalised TC
Khosla et al., 2012[9]	Palliative Care in India: Current Progress and Future Needs	81	7.3636	5.2129
Chaturvedi et al., 2009[10]	Communication with Relatives and Collusion in Palliative Care: A Cross-cultural Perspective	76	5.4286	5.0667
Narayanan et al., 2010[11]	'BREAKS' Protocol for Breaking Bad News	72	5.5385	5.4037
Anaraki et al., 2012[12]	Quality of Life Outcomes in Patients Living with Stoma	64	5.8182	4.1188
Zamanzadeh et al., 2015[13]	Effective Factors in Providing Holistic Care: A Qualitative Study	63	7.875	6.4615
Nayak et al., 2017[14]	Quality of Life among Cancer Patients	62	10.3333	7.4325
Kumar, 2011[15]	Utilisation of Brief Pain Inventory as an Assessment Tool for Pain in Patients with Cancer: A Focused Review	61	5.0833	5.6273
Somasundaram and Devamani, 2016[16]	A Comparative Study on Resilience, Perceived Social Support and Hopelessness Among Cancer Patients Treated with Curative and Palliative Care	56	8	6.6117
Hatamipour et al., 2015[17]	Spiritual Needs of Cancer Patients: A Qualitative Study	56	7	5.7436
Kumar and Jim 2010[18]	Physical Therapy in Palliative Care: From Symptom Control to Quality of Life: A Critical Review	52	4	3.9026
Jafari et al., 2015[19]	Caring for Dying Patients: Attitude of Nursing Students and Effects of Education	51	6.375	5.2308
Zamanzadeh et al., 2014[20]	Factors Influencing Communication Between the Patients with Cancer and their Nurses in Oncology Wards	46	5.1111	5.9355
Lambert and Lambert 2008[21]	Nurses' workplace stressors and coping strategies	46	3.0667	4.2732
Melhem et al., 2016[22]	Nurses' Perceptions of Spirituality and Spiritual Care Giving: A Comparison Study Among All Health Care Sectors in Jordan	45	6.4286	5.3129
Singh and Chaturvedi, 2015[23]	Complementary and Alternative Medicine in Cancer Pain Management: A Systematic Review	45	5.625	4.6154
Sabo, 2008[24]	Adverse psychosocial consequences: Compassion fatigue, burnout and vicarious traumatisation: Are nurses who provide palliative and haematological cancer care vulnerable?	45	3	4.1803
Kumar and Numpeli, 2005[25]	Neighbourhood network in palliative care	45	2.5	6.1475
Satheesh Kumar et al., 2009[26]	Radiation-Induced Oral Mucositis	44	3.1429	2.9333
Jacobsen et al., 2006[27]	Depression and demoralisation as distinct syndromes: Preliminary data from a cohort of advanced cancer patients	44	2.5882	7.2577
Prem et al., 2012[28]	Study of Nurses' Knowledge about Palliative Care: A Quantitative Cross-sectional Survey	42	3.8182	2.703

TC: Total citation

using thematic mapping where 13 major themes were identified and divided into clusters. These major research themes or clusters were then divided into sub-themes. It was also noticed that during this phase, there was a significant increase in research related to the psychosocial effects of cancer. Furthermore, a significant number of studies came from the country Iran.

Major research themes in this period were cancer pain, chemotherapy, radiotherapy in head-and-neck cancer and supportive care along with an increased focus on psychosocial aspects of palliative care.

Major clusters and sub-themes identified in the clusters are represented in [Table 9], along with their frequency of occurrence.

[Figure 9] represents the thematic map of the major themes divided into four quadrants which were.

- Basic Themes: Out of the 13 clusters, eight clusters were under basic themes. The basic themes were palliative care, Iran, radiotherapy, knowledge, cancer, cancer pain, quality of life and pain management
- Motor Theme: The cluster heading India was identified as the motor theme
- Niche Theme: Ampulla Of Valler was identified as the niche theme
- Emerging Themes: Nursing education and Zoledronic acid were identified as emerging themes.

Phase III (2017–2022)

A total of 542 articles were published in this phase, more than twice the documents published in Phase I and Phase II combined. A thematic evolution study was done for this phase to detect and visualise the research themes and their evolution across 3-time periods. Assuming that this phase saw the rise of COVID-19-related research, we divided further divided this phase into three phases so to isolate the COVID-19-related studies from the rest of the research themes to get a clearer picture of research themes pre-COVID, during COVID and post-COVID period:

- Time Slice 1 covered the data from 2017 to 2019 (the Pre-COVID phase)
- Time Slice 2 covered the data for 2020. (The emergence of COVID-19)
- Time Slice 3 covered the data from 2021-2022 (Post-COVID phase).

[Figure 10] is the snapshot of the thematic evolution where it could be observed that the primary research themes during Time slice 1 (2017–2019) were broadly *pain-management, end-of-life care and psychosocial aspects of palliative care.* In Time slice 2 (2020), the major themes were *pandemic, methadone, quality of life and pain management,* while in Time Slice 3 (2021–2022), major themes were *cancer, anxiety and qualitative research.*
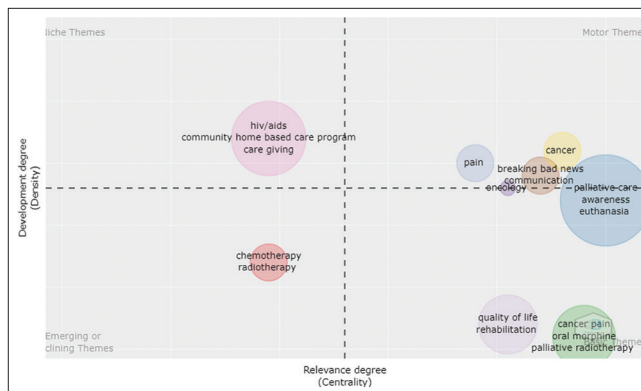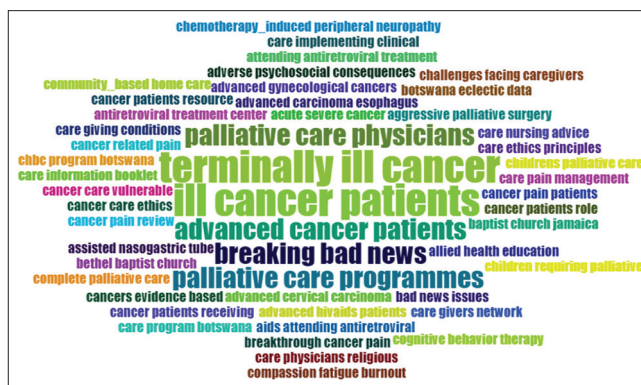

Figure 7: Thematic map of research themes.

Figure 8: Word Cloud (Published titles).

Table 8: Major themes identified through thematic maps (Phase I).

Occurrences	Keywords	Cluster	Cluster_Label
18	Palliative care	2	Palliative care
6	Quality of life	8	Quality of life
5	Cancer pain	7	Cancer pain
4	Pain	4	Pain
4	HIV/AIDS	5	HIV/AIDS
4	Cancer	6	Cancer
3	Community home-based care program	5	HIV/AIDS
2	Chemotherapy	1	Chemotherapy
2	Radiotherapy	1	Chemotherapy
2	Awareness	2	Palliative care
2	Euthanasia	2	Palliative care
2	breaking bad news	3	Breaking bad news
2	Communication	3	Breaking bad news
2	Care giving	5	HIV/AIDS
2	Palliative caregivers	5	HIV/AIDS
2	Perfidy	5	HIV/AIDS
2	Oral morphine	7	Cancer pain
2	palliative radiotherapy	7	Cancer pain
2	Rehabilitation	8	Quality of life
2	Oncology	9	Oncology

Table 9: Thematic mapping; clusters and subthemes (Phase II).

Cluster name	Words (Sub themes)	Frequency of Occurrence
Palliative Care	Home-based Care End-of-life Care	5
Palliative Care	Culture, euthanasia, networking haematological malignancies and squamous cell carcinoma	3
Palliative Care	End-stage renal disease, hyponatremia, maxillectomy, outpatient, palliative medicine, peritoneal dialysis, Saudi Arabia, sickle cell disease, symptom burden, training, cardiopulmonary resuscitation, challenges, delirium, education, dyspnoea, morphine and cervix	2
Quality of Life	Chronic pain, Research	4
Quality of Life	Concurrent chemoradiotherapy, oesophageal cancer, evidence-based palliative care, fact-g, home-based palliative care, journal reporting, perception, publication trend and reliability	2
Radiotherapy	Chemotherapy	8
Radiotherapy	Head-and-neck Cancer and Supportive Care	6
Radiotherapy	Fatigue, palliation and physical therapy	3
Radiotherapy	Adolescents, mechanism-based classification, non-compliance, pain rehabilitation, palliative oncology and treatment	2
Zoledronic acid	Zoledronic acid	2
Pain Management	Children, complications, leukaemia and neuropathic pain	2
Nursing Education	Nursing education and pain assessment	2
Knowledge	Breast Cancer	6
Knowledge	Attitude and end-of-life	5
Knowledge	Terminally ill	3
Knowledge	Awareness, breast self-examination opioids, South India	2
Iran	Nurses	6
Iran	Cancer Patient and Social Support	5
Iran	Attitudes, developing countries Qualitative study and Spirituality	4
Iran	Audit, palliative sedation, end-of-life hospice care, human immunodeficiency virus, multiple sclerosis and physicians self-concept	2
India	Old-age	4
India	Cultural	3
India	Caregivers, communication, family, holistic care multidisciplinary team, psychological, rural, social, survivors, team approach and total pain	2
Cancer Pain	Palliative Radiotherapy	4
Cancer Pain	North-west India, interventions, metronomic chemotherapy, opioid dependence, oral morphine, regional cancer centre, sociodemographic parameters, substance abuse and therapeutic nihilism	2
Cancer	Pain	15
Cancer	Depression, Oncology and Stress	6
Cancer	Communication skills and symptoms	3
Cancer	Anxiety, breaking bad news, critically ill Distress, early specialist palliative care, gabapentin, intensive care unit, music, neuropathic, severe pain, truth-telling and yoga	2
Ampulla of Vater	Extrahepatic biliary obstruction, gall bladder carcinoma and periampullary growth	2

Thematic analysis was done separately for the 3-time slices of this phase to get a broader idea of major research themes and sub-themes.

Time slice 1 (2017–2019)

Fifteen clusters or major research themes were identified during this phase. [Table 10] summarises the research themes in detail.

In the line of the above data, [Figure 11] represents the thematic map of Time Slice 1.

Time slice 2: (2020)

Nine major themes of research were prominent during this phase; pandemic, quality-of-life, death, cancer pain, coping,

methadone, cancer pain management guidelines, cancer and palliative care.

[Table 11] summarises the research themes and sub-themes into basic, motor, niche and emerging research themes.

In line with the table, [Figure 12] is the graphical representation of the thematic map of Time Slice 2 (2020).

Table 10: Research Themes and Sub-themes Time Slice 1 (2017-2019)	
Type of Theme	**Research themes and Sub-themes**
Basic Themes	End-of-life Care
	• End-of-life care in patients
	• Knowledge of End-of-life Care
	• Role of nurses in End-of-life care
	• Attitude, awareness and barriers in end-of-life care
	• Community-based palliative care and meaning of end-of-life care
	Caregiver
	Caregiver's burden, home care and pain management
	Pain Management
	• India
	• Cancer pain
	• Methadone
	• Ketamine
	• Parents
	• Psychological effects
	Decision-making
	• Spiritual counseling
	• Education
	• Surrogates
	• Palliative medicine
	Qualitative research
	Qualitative research on advanced cancer, chronic pain, needs, dyspnoea and neck cancer
	Breast cancer
	Survival
	Survival in malignant pleural effusion
	Head-and-neck cancer
	• Opioid
	• Early Palliative Care
	Palliative care
	• Communication in Palliative Care
	• Collusion
	• Cancer pain
	• Psychosocial aspects
	• Quality of life in palliative care
	• Paediatric Palliative care
	• Spirituality
	• Mental Health
	Continuum of care
	Yoga
	Euthanasia
Motor Themes	Neuropathic pain
	Paediatric Palliative Care
Niche Themes	Psychosocial Research

Time slice 3 (2021–2022)

Fifteen major themes (clusters) were identified during this phase. [Table 12] summarises the major themes and sub-themes during this phase.

In line with the above data, [Figure 13] is the representation of the thematic analysis.

Cocitation network

Cocitation refers to the frequency with which two documents are cited together with other documents.[29] [Figure 14] represents the cocitation network, the unit of analysis being
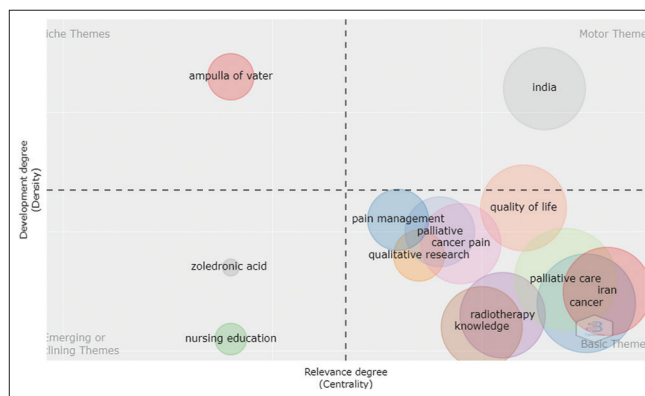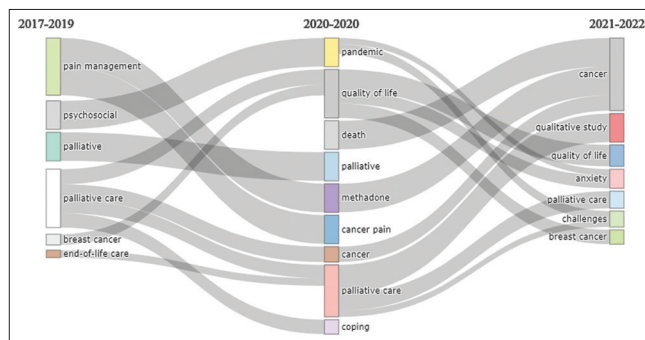

Figure 9: Thematic Map (Phase II).
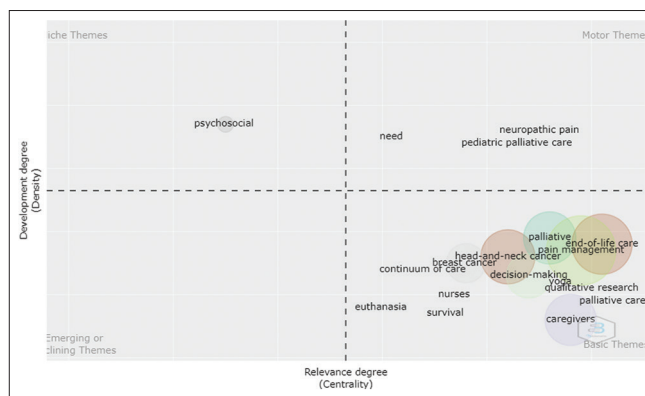

Figure 10: Thematic Evolution.

Figure 11: Thematic Map (Time Slice 1- Phase III).

Table 11: Research Themes and Sub-themes Time Slice 2 (2020)

Theme Type	Research Areas: Major and sub-themes
Basic themes	Palliative Care: • Palliative Care and COVID-19 • End-of-Life care in Palliative Care • Pain management • Home Care • Tele-medicine • Barriers in Palliative Care Quality-of-Life • Chemotherapy • Breast Cancer • Chronic Kidney disease • Anxiety, depression and Distress • Haemodialysis • Caregivers Cancer • Cancer pain • Albumin • Lung Cancer • Neuropathic pain • Pregabalin • Terminally ill Pandemic • COVID-19 • Challenges • Holistic Care • Community Participation • Psychosocial effects Cancer Pain Management Guidelines • Cancer pain special interest group • Celiac Plexus Neurolysis • Home-based palliative care • Hospice • Opioid Death Methadone
Motor Themes	Palliative Medicine Coping in Health-care Professionals

Table 12: Research Themes and Sub-themes Time Slice 1 (2021-2022)

| Type of Theme	Cluster_Label	Sub themes
Niche Themes	Psychosocial adjustment	Psychosocial adjustment
Motor Themes	Stellate ganglion	Stellate ganglion
	Quality of life	Quality of life
	Quality of life	Head-and-neck cancer
	Quality of life	Haemodialysis
	Quality of life	Caregivers
	Breast cancer	Breast cancer
	Breast cancer	Distress
	Breast cancer	Psycho-oncology
	Breast cancer	Psychological distress
	Improvement	Improvement
	Improvement	Quality
	Anxiety	COVID-19
	Anxiety	Depression
	Anxiety	Stress
Basic Themes	Qualitative study	Qualitative study
	Palliative medicine	Palliative medicine
	Palliative care	Palliative care
	Palliative care	Caregiver
	Palliative care	End-of-life care
	Palliative care	Advance care planning
	Palliative care	Attitude
	Palliative care	Chronic kidney disease
	Palliative care	Decision-making
	Palliative care	Dialysis
	Palliative care	Hospice care
	Palliative care	Mortality
	Palliative care	Shared decision-making
	Palliative care	Telemedicine
	India	India
	India	Quality improvement
	India	A3 methodology
	India	End-stage renal disease
	India	Neuropathic pain
	India	Questionnaire
	End-stage kidney disease	End-stage kidney disease
	End-stage kidney disease	Conservative care
	End-of-life	End-of-life
	Documentation	Documentation
	Challenges	Challenges
	Challenges	COVID-19 pandemic
	Challenges	Healthcare workers
	Challenges	Paediatric palliative care
	Cancer	Cancer
	Cancer	Pain
	Cancer	Methadone
	Cancer	Death
	Cancer	Grief
	Cancer	Mindfulness
	Cancer	Opioid
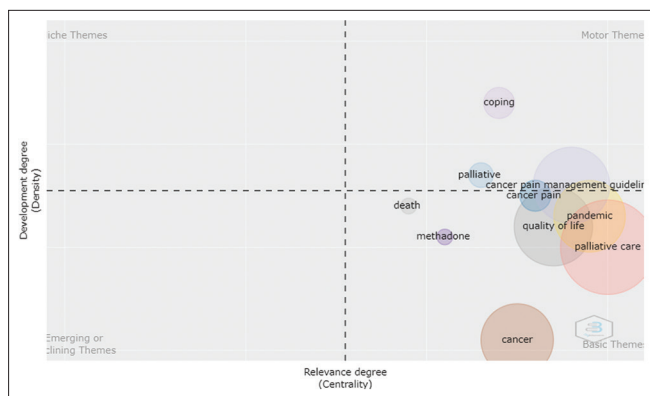
Figure 12: Thematic Map Phase III Time Slice 2.

sources where a cocitation network between the sources was established. The network map shows cocitation patterns of

the 298 journals cited at least 10 times within the articles published in the journal we reviewed. In the figure, it could be seen that the biggest nodes and clusters belong to the IJPC and Journal of Pain and Symptom Management.

Coauthorship network

Coauthorship networks reflect the networks of collaboration between two or more authors of research work.[30] [Figure 15] represents the coauthorship network, the unit of analysis set to authors while the threshold was set to a minimum of two documents per author to measure the coauthorship network, which simply means that an author has to have published at least two articles in IJPC as the first author or co-author to be

a part of the network map. Increasing the threshold would decrease the number of authors and clusters while decreasing the threshold would increase the number of authors and clusters in the network map. Publications with more than 25 authors were avoided to create viable network maps. Out of 2357 authors, 549 authors met the threshold and the largest network connection of authorship was of 382 items divided into 22 clusters, the biggest node being of the author Bhatnagar S. The different colours indicate the different clusters.

[Figure 16] represents the coauthorship network, the unit of analysis was set to 'Country', the threshold was set to a minimum of two articles published by the authors of a country. Forty-one countries met the threshold criteria. [Figure 9] depicts that India is taking a centre stage with the biggest node followed by Iran and U.K.

[Figure 17] represents the coauthorship networks concerning their affiliations. The unit of analysis was set to 'organisation'. The threshold was set to a minimum of five documents per organisation. Out of 484 organisations, 53 met the threshold and the largest set of connected nodes was 35 organisations. AIIMS and *Tata memorial hospital* are the two central nodes with the biggest networks.

Bibliographic coupling

When two works reference a common third work in their respective bibliographies, bibliographic coupling

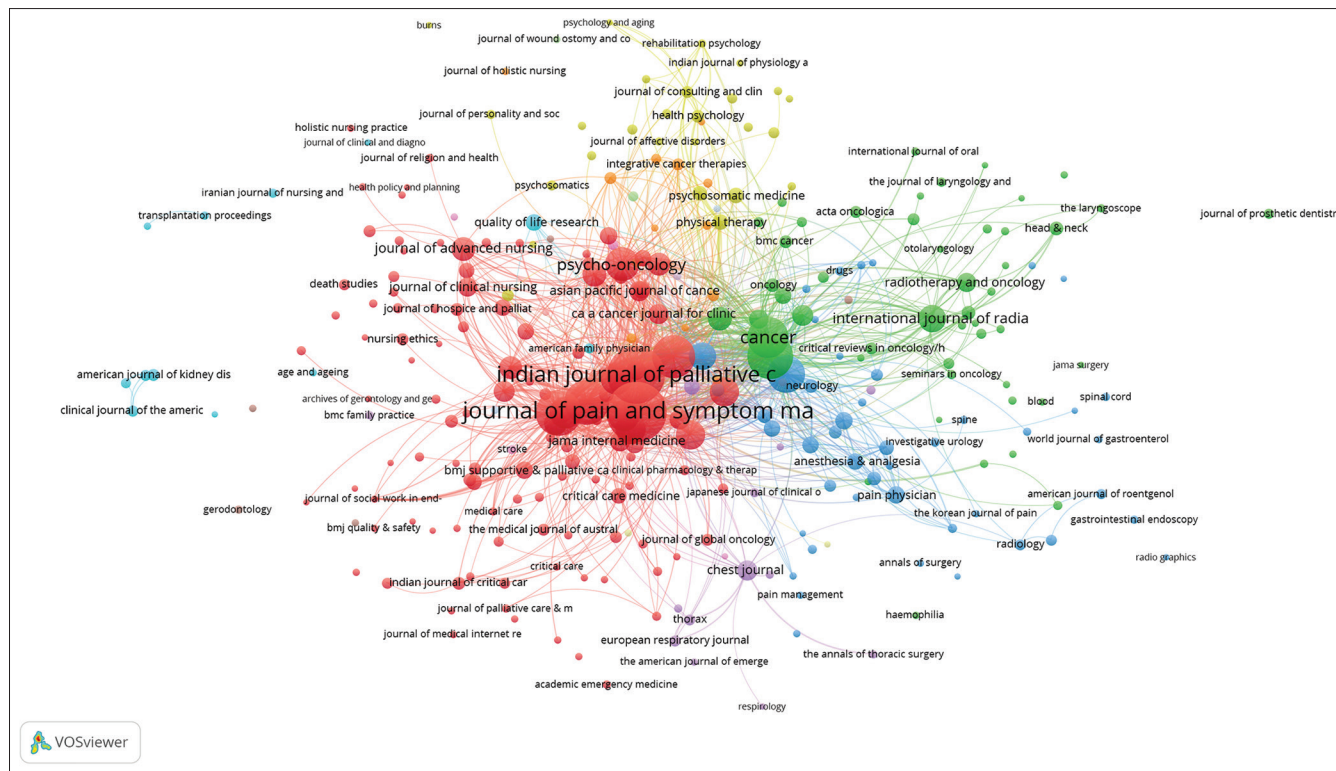**Figure 13:** Thematic Analysis (Time slice III).

Figure 14: Cocitation network between sources.

occurs.[31] Bibliographic coupling is done to map the relationship between documents, sources, authors, organisations and countries. [Figure 18] is the density map of bibliographic coupling, the unit of analysis was documents. The threshold was set to at least three citations per document, 531 documents met the threshold out of which 419 documents had the largest set of connections. The density visualisation best represented the coupling instead of network visualisation. The density around the document, Khosla D, (2012), Nayak SK, (2017) and Chaturvedi SK, (2009), is the denser areas as represented in [Figure 18].

[Figure 19] represents the bibliographic coupling between authors. The threshold was set to at least five documents produced by an author. Out of 2577 authors, 71 met the threshold.

[Figure 20] represents the bibliographic coupling between affiliations. The unit of analysis is organisations (Affiliations).

The threshold was set to a minimum of five documents per organisation. Out of 484 organisations, 53 met the threshold. A strong network could be seen between AIIMS, Tata memorial hospital and NIMHANS.

[Figure 21] represents bibliographic coupling, the unit of analysis being countries. The threshold was set to at least four documents produced by a country. Out of 50 countries, 25 met the threshold. India is one of the central nodes in the network map.

Cooccurrence map based on text data

[Figure 22] represents the analysis of the titles of studies published in the IJPC; here, a cooccurrence network map was created using the text data extracted from the 'Titles.' The binary counting method was chosen for the analysis and the minimum number of occurrences of the term was set to be 5. A total of 132 terms matched the criteria.
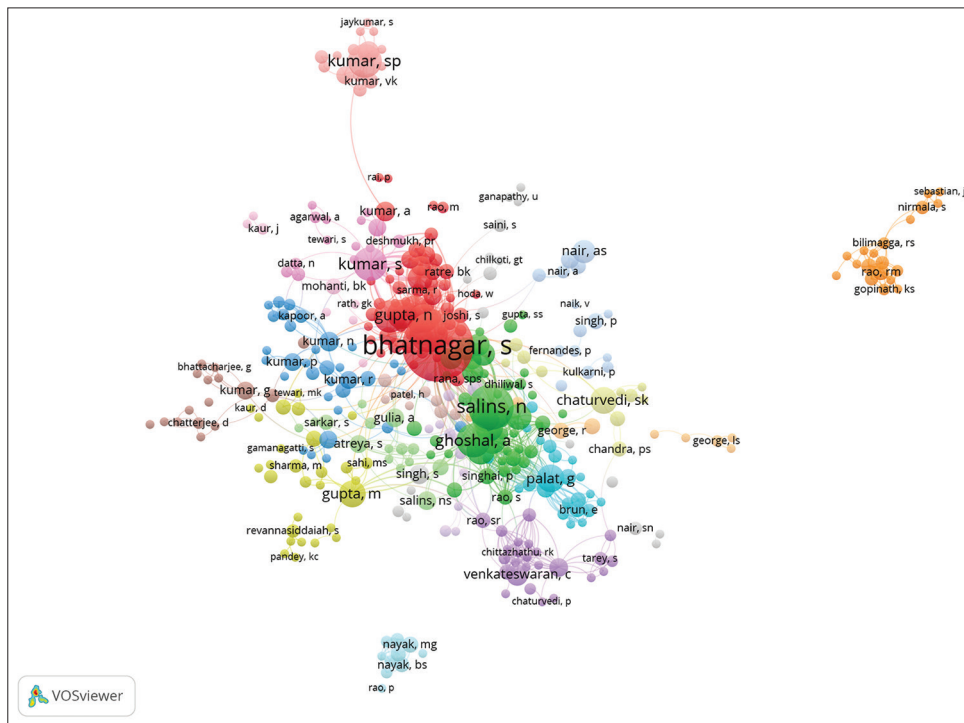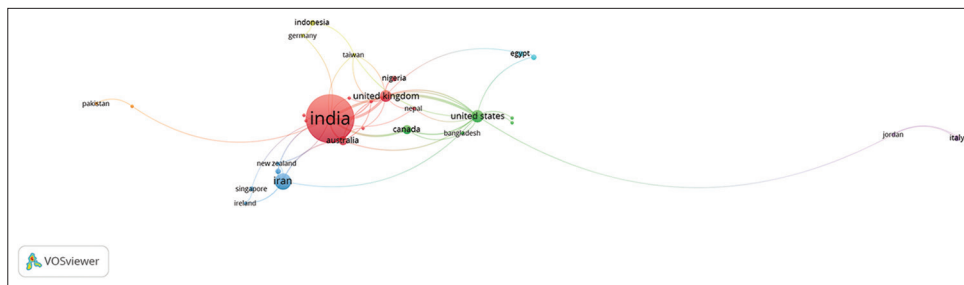

Figure 15: Coauthorship network: Authors.

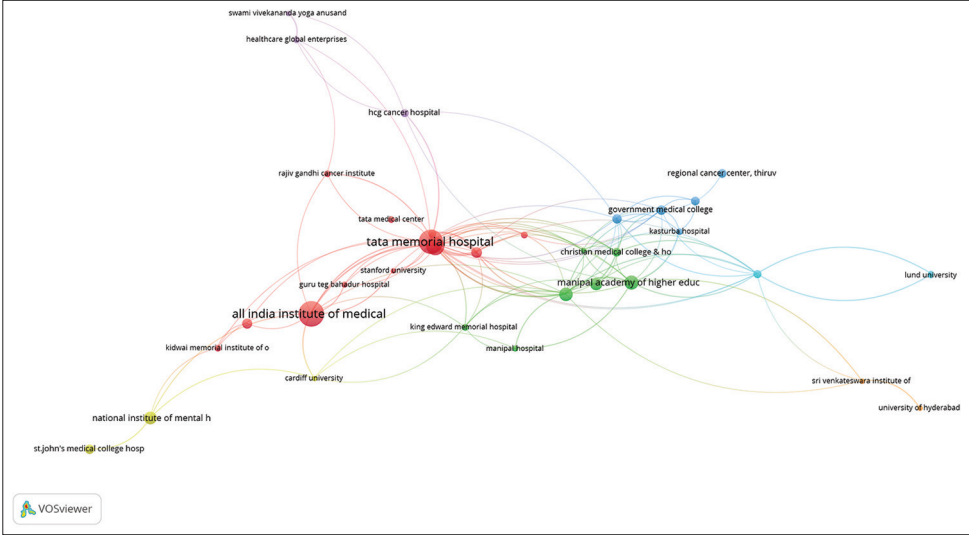**Figure 16:** Coauthorship network: Countries (Please find attached separately).

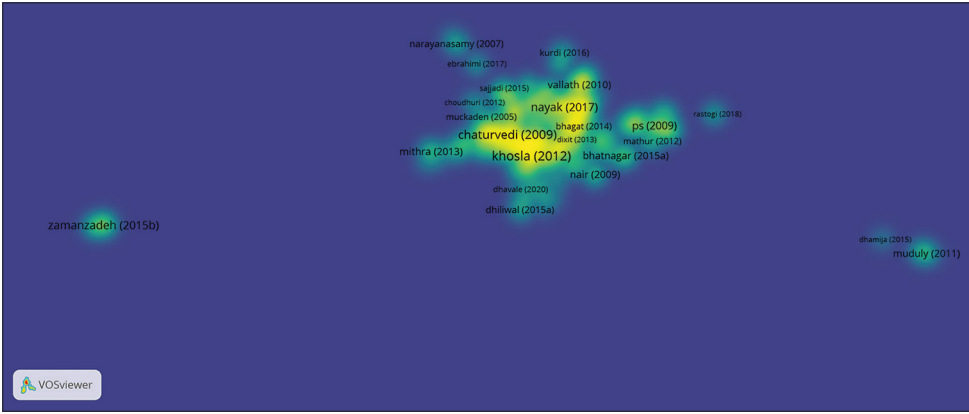**Figure 17:** Coauthorship network: Affiliations (Organisations).

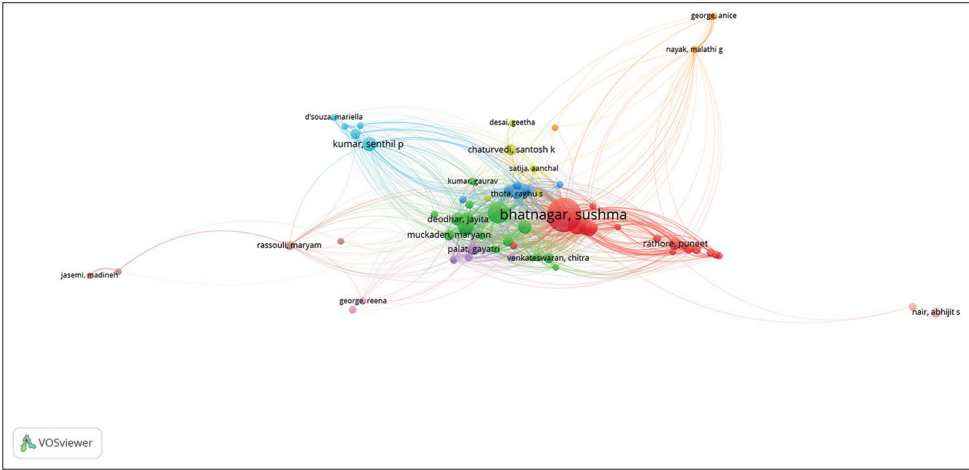
Figure 18: Bibliographic coupling: Documents.

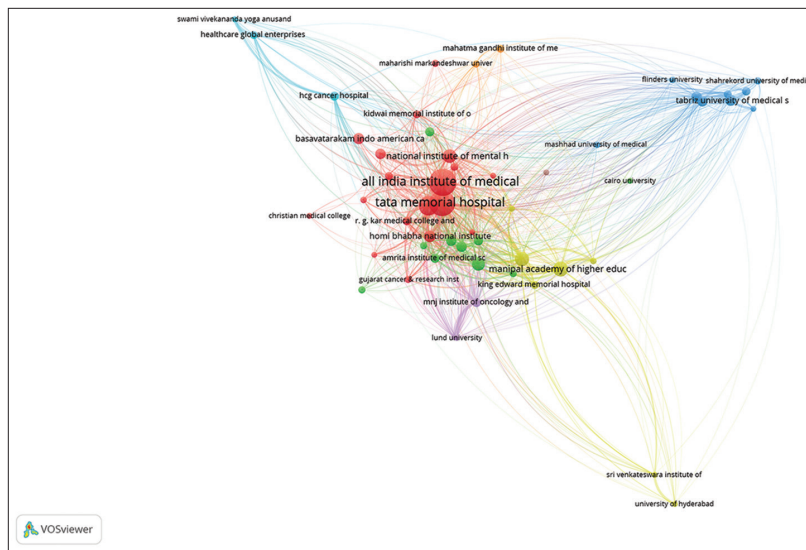**Figure 19:** Bibliographic coupling: Authors (Please find attached separately).

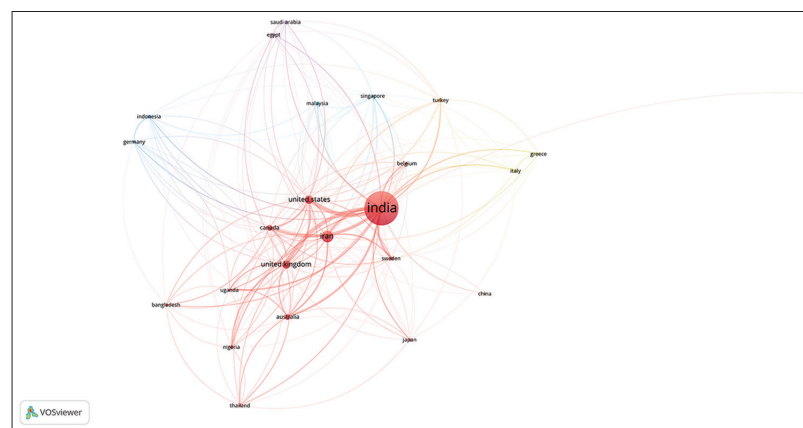**Figure 20:** Bibliometric coupling; organisations (Affiliations).

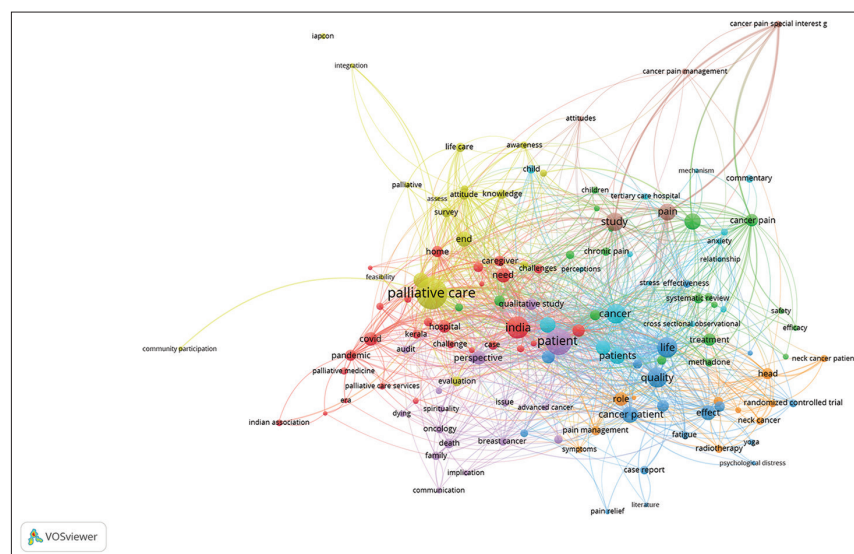**Figure 21:** Bibliographic coupling: Countries.

Figure 22: Cooccurrence map of text (Title).

DISCUSSION AND CONCLUSION

The bibliometric analysis of IJPC provides a comprehensive bibliometric overview and visualisation of the bibliometric data of the journal. Keeping in mind, the four-step procedure of conducting bibliometric analysis as proposed by Donthu et al.,[8] the analysis was conducted. The purpose of the study is to create a detailed and multifaceted picture of the characteristics of the IJPC to get an insight into the research activity in the field of palliative care in India. Dimensions database was used to mine the bibliographic data where a total of 1046 records from the year 2005 to 2022 (Accessed on January 19, 2022) were downloaded in CSV format. Two software; Biblioshiny by Bibliometrix and VOSviewer were selected for data analysis. The results gave an insight into the growth of the journal over the years. In the beginning years, the number of publications by the journal had somewhat been modest; however, a gradual positive upward trend could be noticed.

Analysis of institutions and countries depicted that mostly the Indian institutions and authors are the leading publishers, followed by Iran and U.K. A strong connection of the IJPC could be seen with leading journals publishing in the field of palliative care globally.

A multiphasic thematic analysis gave us a detailed overview of research themes and research trends over time. To understand the key areas of research and major themes, the bibliometric data were divided into three phases based on the year of publication. Phase I covered the publications from the year 2005 to 2010, Phase II covered the publications from the year 2011 to 2016 and Phase III covered the publications from the year 2017 to 2022 (till January 2022). Phase III was further divided into three more time slices assuming that this phase saw the rise of COVID-19-related research, we further divided this phase into three phases so to isolate the COVID-19-related studies from the rest of the research themes to get a clearer picture of the research themes pre-COVID, during COVID and post-COVID period. *Time slice 1* covered the data from 2017 to 2019 (the Pre-COVID phase), and *Time slice 2* covered the data for 2020. (The emergence of COVID-19) and *Time slice 3* covered the data from 2021 to 2022 (Post-COVID phase). The thematic analysis highlighted that cancer, cancer pain, communication, end-of-life care and breaking the bad news had been consistent themes during the three phases. Research themes related to psychological, psychosocial and mental health-related aspects of palliative care. Research in paediatric palliative care, head-and-neck cancer, chemotherapy, radiotherapy and breast cancer is a steady rise from the second phase onward. The third phase that saw the emergence of COVID-19 had a rise in pandemic-related research such as psychological effects of COVID, home-based palliative care, telemedicine and community support.

This study would provide the potential authors and general readers of the journal a detailed overview of the most relevant documents and authors to look for in the journal, along with a detailed overview of major, emerging and niche research themes in the field of palliative care in India. It would also encourage new authors and organisations to publish with IJPC for a significant impact.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Srivastava R, Srivastava S. Bibliometric analysis of Indian journal of palliative care from 1995 to 2022 using the VOSviewer and Bibliometrix software. Indian J Palliat Care 2022;28:338-53.