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International trends and key contributors in dispatcher-assisted cardiopulmonary resuscitation research: a 25-year bibliometric analysis

Guglielmo Imbriaco[a,b,*], Nicola Ramacciati[c]

Abstract

Background: Dispatcher-assisted cardiopulmonary resuscitation (DA-CPR) has become a vital intervention for improving the survival rates after out-of-hospital cardiac arrest. Despite its importance, the DA-CPR research landscape has not been comprehensively analyzed. This study aims to conduct a bibliometric analysis of DA-CPR research published from 2000 to 2024 and to identify trends, key contributors, and international collaborations, mapping the global scientific landscape and highlighting areas for further investigation.

Methods: A retrospective bibliometric analysis was conducted using data from the Scopus database. Articles and reviews published from 2000 to 2024 were included. Data were analyzed using Microsoft Excel and VOSviewer to assess publication trends, geographic distribution, influential authors, journals, and keyword co-occurrence.

Results: A total of 375 publications were identified, with a significant increase in research output since 2014. The United States, South Korea, Germany, Japan, and China were the leading countries in DA-CPR research, whereas contributions from developing regions were nearly nonexistent. *Resuscitation* emerged as the leading journal publishing the majority of DA-CPR-related articles. Keyword analysis identified 486 unique terms, with "cardiopulmonary resuscitation," "out-of-hospital cardiac arrest," and "emergency medical services" being the most frequently used terms, underscoring the central themes in DA-CPR research. Additionally, terms such as "dispatcher-assisted CPR," "bystander," and "telephone CPR" highlighted the focus on the critical roles involved in the DA-CPR process.

Conclusion: This bibliometric analysis highlighted the consistent growth in DA-CPR research, with increasing international collaboration and scientific output from North America, Asia, and Europe. Nonetheless, the lack of studies in developing countries underscores the urgent need to expand DA-CPR initiatives and global research efforts to improve cardiac arrest survival outcomes.

Keywords: Bibliometric analysis, Cardiopulmonary resuscitation, Dispatcher-assisted CPR, Emergency medical communication center, Out-of-hospital cardiac arrest

Introduction

Out-of-hospital cardiac arrest (OHCA) is an important public health issue with survival rates heavily dependent on the timely initiation of cardiopulmonary resuscitation (CPR).[1] Dispatcher-assisted CPR (DA-CPR) has emerged as an essential intervention for improving the survival outcomes of OHCA patients in terms of shockable rhythms found by emergency medical service (EMS) personnel, return of spontaneous circulation, and hospital discharge with favorable neurological performance.[2,3] DA-CPR involves emergency dispatchers in the first links of the chain of survival, guiding bystanders through the steps of CPR via telephone and effectively bridging the gap between cardiac arrest occurrence and EMS personnel arrival.[4,5]

The concept of DA-CPR has attracted interest since the early 2000s, with studies consistently demonstrating its effectiveness in increasing the likelihood of bystander CPR, which is a critical determinant of survival.[6] DA-CPR is currently recommended by international guidelines as a strategic element of a bundled "systems saving lives" approach, emphasizing the collaborative interaction between emergency medical communication center dispatchers and communities.[7,8] Despite its demonstrated benefits, the implementation and success of DA-CPR substantially vary according to factors such as dispatcher training, bystander collaboration, public awareness, and emergency medical communication center resources and organization.[9,10]

Over the past two decades, the literature on DA-CPR has considerably expanded, reflecting the growing interest of researchers, clinicians, and policymakers in optimizing this life-saving intervention. Bibliometric analysis has gained popularity in various research domains, including health care and business research as a method to quantitatively evaluate the evolution of scientific literature, identify influential contributors, and map collaboration patterns.[11,12] This technique is based on the analysis of large-scale publication data and citation metrics extracted from a scientific database. The availability of dedicated bibliometric software such as VOSviewer allows

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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for in-depth analyses and visual mapping of relationships among researchers, institutions, countries, or keywords.

This bibliometric analysis aimed to examine the evolution of DA-CPR research published from 2000 to 2024 and to provide a comprehensive overview of the scientific landscape pertaining to DA-CPR by analyzing trends in publication volume, identifying key contributors (authors, journals, and influential articles), and mapping international collaborations and major research themes. The findings highlight not only the progress made in this field but also the areas where further research is required to improve the efficacy and implementation of DA-CPR across diverse settings.

Methods

The current bibliometric analysis was based on a retrospective quantitative evaluation of published research on DA-CPR from 2000 to 2024.

This study was conducted following the four stages of the framework for bibliometric research proposed by Öztürk et al. (2023)[13]: (1) defining the aim of the research, (2) collecting data on the relevant literature, (3) analysis and visualization, and (4) interpreting the findings and results.

This bibliometric analysis was designed to address the following research questions:

What are the publication trends of DA-CPR research?

What is the geographical distribution of DA-CPR research?

Which authors, documents, and journals have had the greatest influence on DA-CPR research over the past 25 years?

What are the most frequently used keywords and their relations?

A search of relevant literature was conducted using the Scopus database. Owing to technical and methodological considerations, this bibliometric analysis was performed using a single curated source, which is consistent with established practices.[11,12] Scopus was chosen for this analysis because of its broad international journal coverage, high-quality indexing, and compatibility with bibliometric tools such as VOSviewer.[14,15] Similar approaches had been employed in recent bibliometric studies on emergency medicine and resuscitation science.[16–18] This decision ensured consistency in the metadata and minimized duplication bias during data extraction and visualization.

The query was developed using the words "dispatcher-assisted cardiopulmonary resuscitation" and a wide range of synonyms, combined with the Boolean operator "OR" (Supplementary Table 1, http://links.lww.com/ECCM/A96). Our search was limited to standard peer-reviewed research papers (i.e., articles and reviews) to ensure the inclusion of high-quality and methodologically robust studies. No language limits were applied. The search was limited to the timeframe 2000–2024. This choice allowed an extended 25-year analysis, providing a broad perspective on the evolution of DA-CPR research. The year 2000 also marked the beginning of increased recognition of the role of dispatchers in international resuscitation guidelines. Moreover, limiting the search to this timeframe ensured more consistent and complete bibliometric metadata, as records prior to 2000 in the Scopus database often lacked abstracts, citation data, or standardized indexing. Similar or shorter timeframes have been used in previous bibliometric studies in the emergency medicine or resuscitation domains.[18,19] Database consultation was conducted on a single day (January 10, 2025) to avoid bias that could arise from database updates.

The titles, abstracts, and keywords of the retrieved records were screened for inclusion by two independent researchers (Imbriaco G and Ramacciati N), and any disagreements during the screening process were resolved through discussion. All records reporting information on DA-CPR as an intervention or outcome in clinical and simulated studies were included in the analysis. Publication data of the included records were exported from the Scopus database in a CSV file, including the following fields: citation information (authors, document title, publication year, source title, citation count, source and document type, and digital object identifier), bibliographical information (affiliations and publisher), abstract and keyword information, and funding details. Data were processed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) for the preliminary and descriptive analyses of basic bibliometric indicators (citation count, average citation count per document, or year).

Bibliometric analysis and science mapping visualization were conducted using VOSviewer version 1.6.20 (www.vosviewer.com). Co-authorship (authors and countries), citations (documents and journals), and keyword co-occurrence were analyzed. The unit of analysis was defined by the objective of each subanalysis (eg. author keywords for co-occurrence and countries for collaboration networks), and the full counting method was employed throughout. For inclusion in the visual maps, minimum thresholds of five occurrences for keywords and five publications for each country were set. VOSviewer items were visualized as nodes (circles) with sizes proportional to their frequency of occurrence. Links between nodes denoted relationships such as co-authorship or keyword co-occurrence. The Link Strength (LS) metric, which reflects the number of shared occurrences between two items (eg. the number of co-authored publications between two countries), was visually represented by the thickness of the connecting line. The Total Link Strength (TLS), which is the sum of an item's LS values with all other items in the network, indicated the overall degree of collaboration or co-occurrence, with higher TLS representing stronger relationship and greater co-occurrence.

In addition to the citation and publication counts, the *h*-index was calculated for the top contributing countries, authors, and journals to evaluate their combined productivity and scholarly impact. The *h*-index, defined as the number of publications (*h*) cited at least *h* times,[20] provides a more balanced perspective than citation counts alone because it accounts for both output volume and citation performance. The *h*-index values for authors and journals were calculated based on the subset of publications included in this bibliometric analysis and did not reflect their global *h*-index values.

The Impact Factor, CiteScore, and SCImago Journal Rank were also reported to assess the scientific influence of journals contributing to DA-CPR research. The Impact Factor, sourced from Journal Citation Reports (Clarivate Analytics), reflects the average number of citations received in a given year by articles published in the previous 2 years. CiteScore, obtained from the Scopus database, uses a 4-year citation window and includes all document types, offering broader coverage. The SCImago Journal Rank, also derived from the Scopus database via the SCImago platform, accounts for not only the number of citations but also the prestige of citing journals based on an algorithm similar to Google PageRank. All journal metrics were retrieved from the most recent reporting year (2023).

This approach followed the recommendations for bibliometric research design from recent methodological literature, allowing for the combination of performance analysis and relational bibliometrics in a reproducible and structured manner.[11–13]

Results

The initial search retrieved 866 records without time or document-type limits. After applying the filters, the number of results decreased to 685. The screening process excluded one duplicate record and 309 publications. Finally, 375 publications were included in the bibliometric analysis (Fig. 1).

Global publication trends

The records comprised 340 articles (90.7%) and 35 reviews (9.3%) written by 1534 authors and published from 2000 to 2024 (Fig. 2).

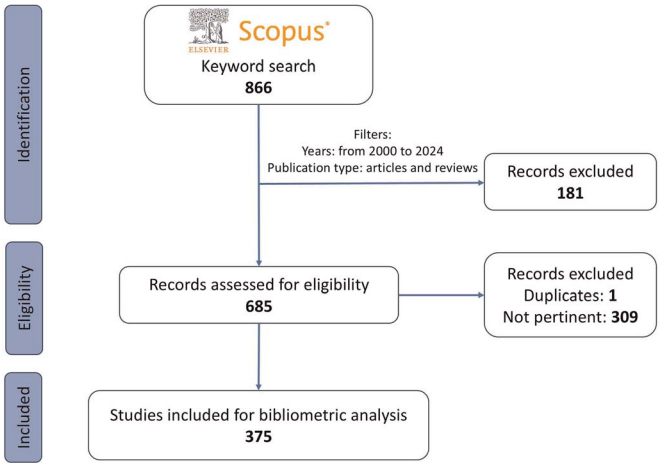

Figure 1. Flow diagram of the database search and screening process.

A relatively small number of studies were published from 2000 to 2006. The number of publications had significantly increased since 2014, almost doubling the number observed from 2006 to 2013, with the most publications in 2021 (n = 37) and 2020 (n = 32). The overall percentage of funded research was 37% (n = 140; range: 0%–54%), with an increase from 2014. Most articles were written in English (87.5%, n = 328), and 26 papers (6.9%) were written in German.

Country analysis

Among the top 20 countries, the United States was the most productive for publication volume, with 80 papers (17.3%) (Fig. 3A). European countries contributed with 210 publications (45.5%), whereas Asian countries contributed with 147 publications (31.8%). All publications were from developed countries (defined as countries with middle to high income according to the current World Bank list).

The United States ranked first in terms of the number of publications (n = 80) and total citations (n = 4010), followed by South Korea, Germany, Japan, and China. The cumulative publication outputs of the top five countries are presented in Fig. 3B. While the publication volume varied, some countries such as Greece and Italy had notably high average citations per article, suggesting a strong impact despite fewer documents, probably related to their contribution to resuscitation guidelines. Supplementary Table 2 (see Supplemental Digital Content at http://links.lww.com/ECCM/A96), presents the articles and citation counts of the top 20 countries.

In terms of citation impact, the *h*-index was calculated for the top five publishing countries to provide a more balanced measure of productivity and scholarly influence. The United States exhibited the highest *h*-index (h = 33), followed by Japan (h = 21), South Korea (h = 20), China (h = 16), and Germany (h = 13). These values reflected not only the publication volume but also the frequency with which these publications had been cited, suggesting a sustained influence in the DA-CPR research field.

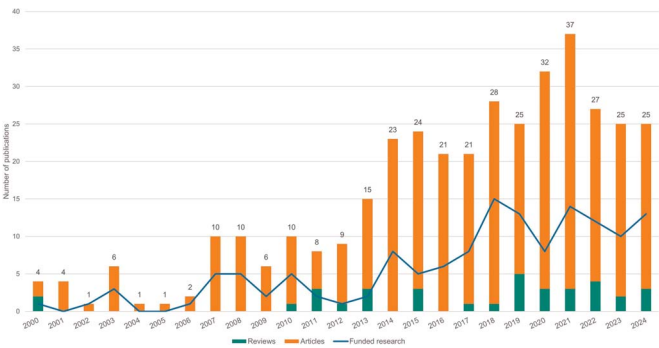

Figure 2. Annual publication trends in DA-CPR throughout the study period. The columns depict the number of articles and reviews published yearly, with the number at the top end denoting the cumulative number. The blue line highlights the number of funded papers. DA-CPR, dispatcher-assisted cardiopulmonary resuscitation.

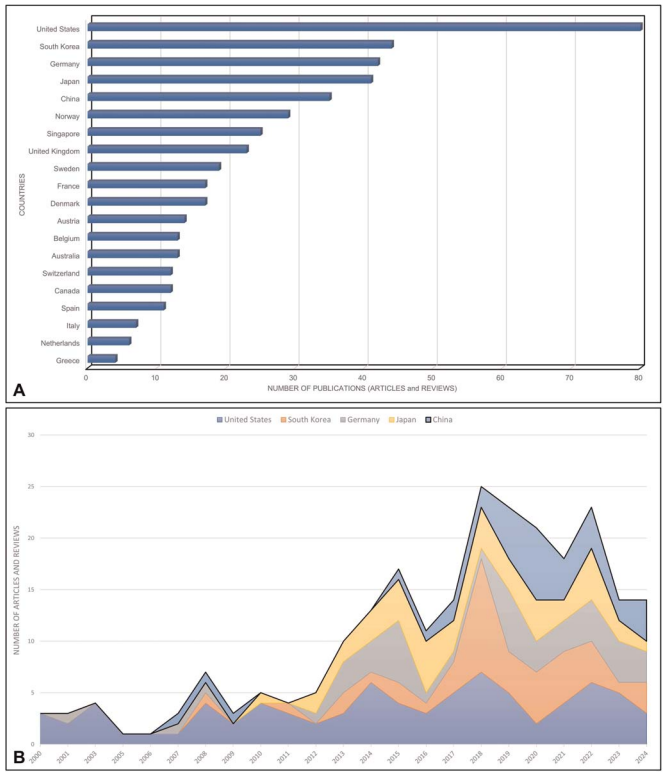

Figure 3. Country analysis. (A) The top 20 most productive countries with respect to DA-CPR research (articles and reviews). (B) Cumulative publication output of the top five countries. DA-CPR, dispatcher-assisted cardiopulmonary resuscitation.

International collaboration

The co-authorship analysis of the 19 countries with at least five publications revealed that the countries most engaged in international collaborations were the United States (TLS 69), Norway (TLS 63), and Singapore (TLS 57). Fig. 4 shows the international co-authorship network, highlighting the research output from different geographical regions and identifying the three research areas. The blue cluster included the United States and several other Asian countries (South Korea, Japan, China, and Singapore). The red cluster comprised central and southern European countries (Germany, Italy, Switzerland, Austria, and Belgium). The green cluster consisted of northern and western European countries (Sweden, Norway, Denmark, and the Netherlands), Canada, and Australia.

The central position and links of the United Kingdom and Norway signified a connection between European research groups,

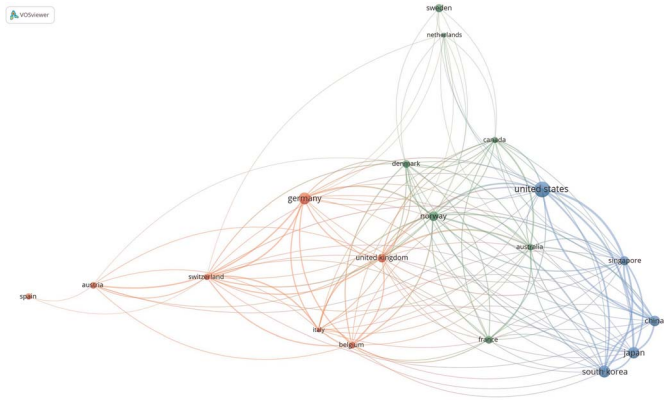

Figure 4. International collaboration network. The analysis of the international collaboration network was based on the co-authorship analysis (minimum of five publications). The size of the dots represents the total number of publications from each country. The thickness of the connecting lines reflects the number of co-authored publications between two countries.

Asian countries, and the United States. The strongest LS was observed between the United States and Singapore (LS = 10), indicating sustained and high-impact partnerships. European countries had high interconnectivity within the region but fewer transcontinental collaborations.

Authors and institutions

Our analysis identified a total number of 1534 authors. Seventy-three published more than five documents, and 157 received more than 100 citations. Supplementary Table 3 (see Supplemental Digital Content at http://links.lww.com/ECCM/A96), presents the 10 most productive authors on DA-CPR, including their countries and institutions, according to the number of publications. Notably, three researchers from South Korea ranked in the top 10. The most productive authors in the field of DA-CPR were primarily affiliated with institutions in Eastern countries (South Korea, Singapore, and Japan), followed by those in Germany, the United States, and Norway. Shin SD (Seoul National University, South Korea) was the leading contributor, followed by Song KJ (Seoul National University Boramae Medical Center, South Korea) and Hong MEO (Singapore General Hospital, Singapore). These authors not only had the highest number of publications but also demonstrated a high citation impact, contributing to several foundational and guideline-influencing studies.

At the institutional level, Seoul National University (South Korea), Singapore General Hospital (Singapore), the University of Washington (USA), and Laerdal Medical (Norway) were among the most prolific. European institutions, including the Karolinska Institute (Sweden), contributed significantly, albeit with fewer but highly cited publications. This pattern reflected the strong leadership of East Asian institutions with key collaborations extending to North America and Europe.

Journals and documents

All included documents were published in 103 journals. Among these, 14 journals published five or more articles. The top 10 journals in terms of publication volume published 212 papers (56.5%) with 7413 citations (Table 1).

Resuscitation, the official journal of the European Resuscitation Council (ERC), and *Circulation*, the official journal of the American Heart Association (AHA), were among the top three journals. *Resuscitation* far exceeded that of other journals with respect to DA-CPR-related research, publishing 31.2% of all papers on DA-CPR (117 articles) with 4907 citations (41.9 average citations per document). *Circulation* published 11 papers (2.9%) with 1427 citations (129.7 average citations per document).

Supplementary Table 4 (see Supplemental Digital Content at http://links.lww.com/ECCM/A96), lists the 20 most-cited documents. Guidelines and consensus papers exhibited a greater average citation count per year, with the 2021 Executive Summary of the ERC guidelines cited 373 times in only 3 years.[21] The second and fourth documents were published more than 20 years ago and could be considered milestones in cardiac arrest research, specifically focusing on DA-CPR. Hallstrom et al. compared hands-only DA-CPR with CPR, including mouth-to-mouth ventilation, and identified no statistically significant differences in survival to hospital discharge between the two groups; however, they deemed hands-only CPR to be a simpler approach for instructing untrained bystanders.[22] Rea et al. retrospectively compared the outcomes of cardiac arrest victims and reported a 1.45 adjusted odds ratio of survival for DA-CPR compared with no CPR.[23]

Keyword analysis

The analysis identified 486 keywords. Supplementary Table 5 (see Supplemental Digital Content at http://links.lww.com/ECCM/A96), presents the 20 terms showing the highest frequency. The

Table 1

Top 10 Journals

	Journals	Documents	%	Citations	%	Average Citation Count per Document	*h*-Index*	Impact Factor (IF)†	CiteScore‡	SJR‡
1	*Resuscitation*	117	55.2	4907	66.1	41.9	39	6.5	12.0	2.363
2	*Prehospital Emergency Care*	15	7.1	206	2.8	13.7	8	2.1	4.3	0.849
3	*Notfall und Rettungsmedizin*	13	6.1	89	1.2	6.8	6	1.2	1.8	0.288
4	*Resuscitation Plus*	13	6.1	55	0.7	4.2	4	2.1	3.0	0.758
5	*Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*	12	5.7	249	3.4	20.8	8	3.0	6.1	1.030
6	*Circulation*	11	5.2	1427	19.2	129.7	10	35.6	45.7	8.415
7	*American Journal of Emergency Medicine*	9	4.2	89	1.2	9.9	6	2.7	6.0	0.858
8	*BMC Emergency Medicine*	8	3.8	72	1.0	9.0	4	2.3	3.5	0.745
9	*Emergency Medicine Journal*	7	3.3	167	2.3	23.9	5	2.8	4.4	0.956
10	*European Journal of Emergency Medicine*	7	3.3	152	2.1	21.7	5	3.1	3.6	0.585

Journals' performance: *The *h*-index refers to the number of publications (h) within the analyzed dataset that have each received at least h citations. †Impact factor (IF) was sourced from the Journal Citation Reports (Clarivate Analytics). ‡CiteScore and Scimago Journal Rank (SJR) data were extracted from Scopus. All performance indexes are related to 2023.

top three keywords ("cardiopulmonary resuscitation," "out-of-hospital cardiac arrest," and "cardiac arrest") were broadly used in cardiac arrest research, whereas the other keywords were mainly related to the actors ("emergency medical services," "dispatcher," and "bystander") and actions ("dispatcher-assisted CPR," "telephone CPR," and "bystander CPR") involved in telephone DA-CPR process. Fig. 5A presents a network visualization of the co-occurrence of keywords (minimum of five, n = 35) grouped into six clusters with different colors (Fig. 5C). Fig. 5B shows a word cloud providing a visual representation of the frequency of the most commonly used keywords.

Discussion

This bibliometric study presents a comprehensive map of the global research on DA-CPR over the past 25 years, which, to the best of our knowledge, has not been addressed in this scope. This study offers a broad overview of publication trends, research impacts, international collaborations, and thematic evolution, underscoring the increased interest in a particular facet of resuscitation science. The findings revealed increasing academic attention to DA-CPR since the early 2000s, with growing publication output, particularly from East Asia, North America, and parts of Europe.

Bibliometric analyses allow for the identification of emerging trends or article and journal performance, examination of collaboration patterns, and research contributors to a specific field within the existing literature.[11,12] Another important value of these studies is their ability to explore intellectual frameworks and identify research gaps, thereby fostering a sense of membership among researchers identified with a field.[12]

Emergency medicine is a relatively young discipline, and bibliometric analyses represent a valuable tool for evaluating its evolution in both clinical and research fields.[16] Similar studies have reported an almost constant increase in the rate of scientific production in emergency medicine.[16,24,25] Xu et al. showed a clear upward trend in prehospital emergency research, increasing rapidly between 2009 and 2013, rising again in 2018, and estimated a continuing rise over the next decade.[17] A study on OHCA articles and reviews reported an annual publication growth from 13 in 1998 to 453 in 2021, with an average yearly increase of 16.7 publications, accelerated after 2008.[19] CPR has gradually become an important subject in emergency medicine research, with the number of CPR-related publications almost doubled in a 10-year interval, from 631 in 2010 to 1192 in 2019.[18,20] The analysis by Danis et al. showed exponential growth, with 551 publications in 2010 (+106% compared to 2000, n = 268) and 1299 in 2020 (+136% compared to 2010, and +385% compared to 2000).[18]

Our results regarding the increase in funded research are comparable to those reported by Smith et al., in which the proportion of funded studies increased significantly, from 18.6% in 1997 to 41.2% in 2017. The authors also underscored the increased quality of published studies, with greater rigor in research methodology, improved results presentation, and more multicenter and international collaborations.[25]

In previous bibliometric studies, the United States ranked first in the number of emergency medicine publications, followed by England, Canada, Turkey, Australia, and China.[16,17] Despite the historical dominance of the United Kingdom and United States, proportional contributions from Asia, Europe, and other countries are growing.[25] Our findings correlate with the results of other similar specific bibliometric analyses on cardiac arrest and CPR, more comparable with our study, showing the leading role of the United States but also a significant and increasing number of contributions from other countries, such as Japan, South Korea, Germany, and the United Kingdom.[18–20] Even if the USA, Sweden, and Japan achieved the greatest number of citations[19], Jia et al. assessed the degree of centrality of a country's publication (indicating the significance of nodes in a definite network), finding that Australia had a more influential role than the USA, the United Kingdom, and Italy.[26]

Our search did not identify articles or reviews published in low-income countries. Developed countries ranked the highest in the number of publications, suggesting that a country's economic strength may significantly influence research on prehospital emergency care.[17] Furthermore, another study identified strong and statistically significant positive correlations between the number of CPR-related articles published by countries and their Gross Domestic Product (GDP) and GDP per capita.[20] The shortage of articles from developing countries highlights the need to promote and support these regions through tailored implementation and research projects on DA-CPR.

Our geographical analysis identifies international collaboration networks and three main research areas (Europe, Asia, and the United States) with a fair distribution of research outputs. Similarly, Li et al. described how OHCA international collaboration was divided into four clusters: one led by the USA and Canada, one by Asian countries, and two European clusters, one led by Germany and France, and the other by Denmark and Sweden.[19] Research

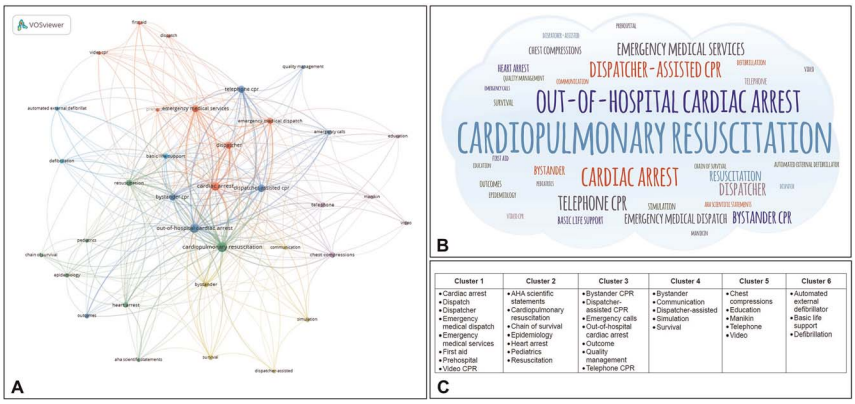

Figure 5. Keyword analysis. (A) Network visualization of the co-occurrence of author keywords (minimum of five). (B) Word cloud showing the frequency of the most commonly used keywords (the size of each word indicates its frequency). (C) Author keyword clusters. CPR, cardiopulmonary resuscitation.

teams that focus on CPR are spread across various institutions worldwide, highlighting the need for stronger collaboration[27]

We found that more than half of the DA-CPR-related research was published by 10 journals, and more than half by a single journal (*Resuscitation*), indicating a highly specific interest in this topic. When considering DA-CPR as a part of a bundled set of community-based interventions to improve OHCA outcomes[7,28], this aspect may represent a potential limit to sharing and disseminating DA-CPR results to a broader range of readers. Similarly, other authors reported that almost half of the papers in the field of prehospital emergency research (44.1%) were published in 10 journals, with *Prehospital Emergency Care* and *Resuscitation* accounting for 19.7% of the total publications.[17] *Resuscitation* is recognized as the leading journal in cardiac arrest science, publishing 17.59%–29.57% of CPR- and OHCA-related publications.[19,20,26,27] *Circulation* confirms its higher average citation count, following two top-tier journals (*New England Journal of Medicine* and *JAMA* [*Journal of the American Medical Association*]). Notably, the majority of the most-cited articles were guidelines or CoSTR-related documents, potentially amplifying the citation impact of specific journals.[18,20]

Over the last decade, cardiovascular emergencies, resuscitation, mortality, patient outcomes, emergency imaging, triage, education, and management have been identified as the most prominent research topics in emergency medicine.[16] The analysis of hotspots and the evolution of OHCA research yielded seven categories of keywords, with cluster #1 ("emergency medical services") including the terms "dispatch," "layperson," and "barrier" from 2016.[19] In contrast, keyword occurrence and word cluster analyses in other bibliometric studies on cardiac arrest and CPR did not report any terms related to DA-CPR.[19,20,26,27] Our research analyzed a peculiar aspect of CPR by identifying keywords that are likely to be less commonly used in articles addressing the topic more broadly. We hypothesize that DA-CPR, despite attracting growing interest, is often included in broader discussions and rarely regarded as the main topic. For instance, a recent paper by Fijacko et al. categorized the abstracts published at ERC scientific congresses over the last 10 years according to the resuscitation guidelines' main topics. In particular, the topics "basic life support" and "systems saving lives" both including DA-CPR, accounted for 50.1% and 40.1%, respectively.[29] Finally, we identified a wide range of author keywords, potentially indicating the need for standardized terminology or even a specific MeSH term for DA-CPR.

Beyond offering a descriptive overview, this bibliometric analysis may serve as a tool to inform future research and policy directions regarding systemic responses to OHCA. By identifying influential studies, leading contributors, and collaborative patterns in DA-CPR, our findings may support research partnerships, funding priorities, and targeted educational efforts to develop more responsive and evidence-informed guidelines for resuscitation. Future research should explore the effectiveness of DA-CPR in specific patient populations, such as children and elderly individuals. Additional studies investigating the impact of dispatcher training quality, integration of decision-support tools (eg. AI-assisted dispatch), and strategies for implementing DA-CPR systems in low-resource settings with limited EMS infrastructure should be conducted.

Limitations

The primary limitation of this study is the use of a single database (Scopus). However, this is a widely accepted approach in bibliometric research as evidenced by numerous published studies in the field.[11,16,17,20] The Scopus database offers extensive coverage of the biomedical literature, including many peer-reviewed and open-access journals, with rigorous quality control processes.[14,15] Integrating data from multiple databases (eg. Web of Science, PubMed) can introduce technical challenges related to file format incompatibility, metadata inconsistencies, and the risk of duplicate records. Although the inclusion of additional databases could potentially enhance comprehensiveness, the choice of the Scopus database ensured methodological rigor and reliable data extraction for the scope of this analysis.

Another limitation is the inclusion criteria, which restricted the analysis to peer-reviewed articles and reviews. While this approach ensures a focus on high-quality and scientifically validated research, it might have excluded other relevant sources (eg. conference abstracts, editorials, and gray literature), which can sometimes provide early insights or context on emerging areas of interest in DA-CPR. The inclusion of these publication types would have resulted in a greater number of records but potentially lowered the quality of the results. Additionally, the literature search was conducted using titles, abstracts, and keywords, which might have limited the comprehensiveness of the results and potentially overlooked relevant studies in the field. However, our search strategy allowed for the inclusion of all articles and reviews with English abstracts, even those published in other languages. A small number of high-impact guideline papers were included in the dataset, which might have affected the performance indices such as average citations and *h*-index values. Although these documents are highly relevant to the field, they represent consolidated recommendations rather than primary research. Their inclusion was retained for completeness but was acknowledged as a potential source of performance bias. Finally, this study did not include a dual-map overlay of journal citation patterns because this type of visualization (commonly produced using tools such as CiteSpace) is primarily suited for multidisciplinary analyses that explore citation flows across distinct scientific domains. Given the focused and domain-specific nature of our research on DA-CPR, the network visualizations provided by VOSviewer are considered more appropriate and interpretable for the study objectives. Future studies could incorporate this approach to explore disciplinary citation flow further.

Conclusion

This bibliometric analysis revealed an increasing trend in publications related to DA-CPR from 2000 to 2024, indicating a growing interest in this specific facet of CPR science. The high specificity of the subject makes DA-CPR a niche topic, as confirmed by our analysis of journals and authors. The three main research areas are North America, Asia, and Europe. The absence of studies from developing countries underscores the urgent need to extend DA-CPR initiatives and research efforts to improve global cardiac arrest survival outcomes. By identifying influential contributors, collaborative networks, and thematic developments, this study lays the foundation for future research, supports international collaborations, and guides the evolution of evidence-based practices in DA-CPR.

Conflict of interest statement

The authors declare no conflict of interest.

Author contributions

Imbriaco G and Ramacciati N designed the study, collected the data, performed the analyses, interpreted the results, and drafted and refined the manuscript. All authors have read and approved the final version of the manuscript.

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Ethical approval of studies and informed consent

Not applicable.

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