



Study of Paramedic Research: A Quantitative Analysis

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This quantitative assessment explores the empire of paramedic research, aiming to investigate and analyse the current state of knowledge in this field. The study employs a rigorous methodology, gathering data from various reliable sources and employing statistical analysis to draw meaningful conclusions. The primary objectives of this research are to identify trends, patterns, and gaps in paramedic studies and to assess the overall quality and reliability of existing research. By critically evaluating the available data, this study seeks to provide valuable insights for researchers, practitioners, and policymakers to enhance the effectiveness and efficiency of paramedic services. Through a comprehensive exploration of the quantitative landscape, this assessment endeavours to contribute to the advancement of paramedic research and its vital role in healthcare and emergency response systems. Paramedics are skilled emergency responders who deliver rapid medical aid during crises, assess patients, and provide care in trauma centres and hospitals. Their expertise and coordination with physicians make them invaluable in and out of hospital settings, contributing significantly to patient well-being through their dedicated professionalism and best practices.

Keywords: Practitioners, Paramedics, Challenges, Preparedness, Reliability, Statistical analysis

Introduction

Study of Paramedic research a quantitative Assessment presents a rigorous examination of the paramedic field through quantitative analysis. This study delves into key aspects, such as research trends, funding, collaboration, and keyword associations, offering valuable insights into the evolving landscape of paramedic research. A paramedic is a medical professional who specializes in emergency treatment. The word paramedic is a combination of two terms Para and Medic. While “Para” meaning next to, “Medic” meaning a doctor. So, a paramedic is trained personnel who is capable in giving medical treatment to a patient in an emergency or one who is technically conversant to offer his services to Physicians/Doctors^{1,2}. Paramedics are essential in the healthcare system, delivering immediate medical care during emergencies. Their expertise in assessing, treating, and stabilizing patients at the scene significantly impacts survival rates and patient outcomes³.

Paramedics play a key role in saving lives; it is a hands-on job that requires various instances of face-

to-face interactions with patients ,their work in a unique environment that is full of risks and uncertainties³. Effective patient care can be achieved only when a paramedic knows how to manage these risks and is capable of dealing with uncertainties, implementing useful communication skills is extremely important. Paramedic research plays a crucial role in advancing the field of emergency medical services, enhancing patient care, and optimizing healthcare outcomes⁴. The ability to provide timely and effective medical interventions during critical situations is vital for saving lives and reducing morbidity. Consequently, a solid foundation of evidence-based practices, supported by rigorous quantitative assessments, is essential for continually improving paramedic services⁵.

This study focuses on conducting a quantitative assessment of paramedic research to gain valuable insights into the current state of knowledge and identify areas for further exploration. By utilizing quantitative methods, this research aims to analyse data from diverse sources, including academic

journals, reports, and databases, to obtain a comprehensive overview of the field^{6,7}.

Methodology

The methodology employed for the paramedic research study incorporates a quantitative assessment approach. To initiate the process, we identify pertinent paramedic research studies and publications, utilizing reputable databases such as PubMed Google Scholar and. Web of science subsequently; we systematically extract quantitative data, including details such as sample sizes, intervention outcomes, and statistical metrics, from the chosen studies. These acquired data will then undergo rough analysis via statistical software, enabling the confidence intervals. Moreover, we will conduct a comprehensive evaluation of the included studies' quality, employing established assessment tools. Through this quantitative assessment, our study aims to offer valuable insights into paramedic research trends, effectiveness, and reliability, thereby contributing to evidence-based practices within the realm of paramedical services.

This study investigates the extent and nature of database quality assessment practice and paramedics through a systematic literature exploration. Our aim is to uncover the diversity, prevalence and characteristics of database quality assessment methods⁸. The statistics for this study were identified by using "Web of Science", which is one of the popular citation databases. In order to accomplish the results of the study the citation index available in the publication of scholarly articles and books including journals, data compilations etc. has been utilised⁸.

The basic approach followed was by using the "All fields" function for retrieving documents from the "Web of Science" core collections. The Keywords used were "paramedics", "paramedic services" and "Emergency medical service" This quantitative assessment aims to shed light on paramedic research trends, efficacy, and reliability, ultimately enhancing evidence-based practices in paramedical services.

Research Framework **Figure 1** illustrates the process. Online data search involves utilizing basic search features and specifying the relevant year range to retrieve data pertinent to the study's timeline.

Results

The Study of Paramedic Research represents an extensive research initiative conducted simultaneously in the top countries within the paramedic field. Its primary objective is to conduct a quantitative analysis

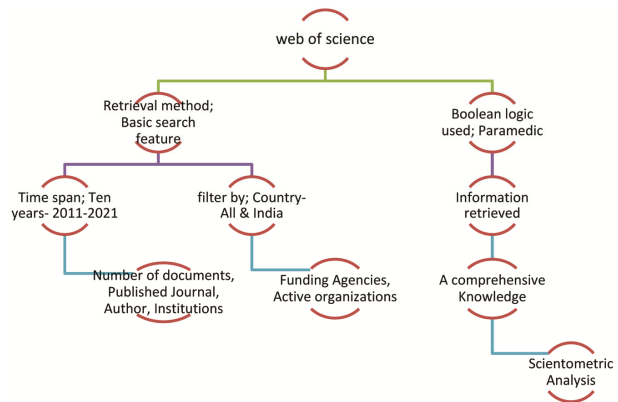


Fig. 1 — Research-Framework

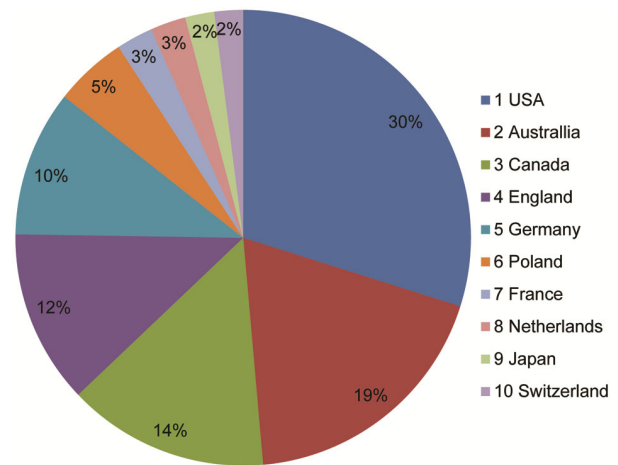


Fig: 2 — Top Ten Countries

to explore various dimensions of paramedic practice, including its influence on patient outcomes, the effectiveness of training programs, and the strategies employed in emergency responses^{8,9}. Through the systematic collection and rigorous analysis of numerical data; this study aspires to furnish valuable insights into the efficacy of paramedic interventions and the overall quality of healthcare delivery across these leading nations. The outcomes are expected to foster evidence-based practices and inform policy making, thereby bolstering the standards of these services not only in these countries but also worldwide¹⁰.

Top countries

In **Figure 2**, as per the Web of Science database, the designated study period spanning from 2011 to 2021, focused on the keyword "paramedic," revealing a substantial corpus of 3,030 documented contributions. Within this discerning exploration, the United States

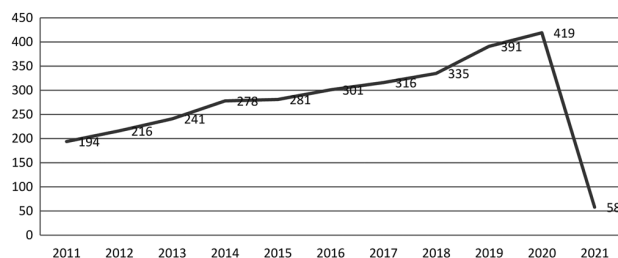


Fig: 3 — Year Wise Publication

emerges as the foremost contributor with 794 publications, followed closely by Australia with 498 publications, Canada with 380, England with 328, Germany with 276, Poland with 137, France with 69, the Netherlands with 67, Japan with 55, and Switzerland with 53 publications, thus delineating the global landscape of paramedic research.

Year wise publication

The statistics gathered from ‘Web of Science’ were analysed using Microsoft Excel for further detailed data analysis. After examination of the data, it was established that the calendar year 2020 was the most productive year with 419 publications from the researchers, but in 2021 it was less only 58 publications.

Figure-3 shows that in the year 2020, a significant Web of Science-indexed publication in paramedic delved into advanced pre-hospital emergency care techniques and protocols. This pioneering study sought to elevate paramedic effectiveness, ultimately improving patient outcomes and making a substantial contribution to the field's knowledge base.

Documents Types

A total of 3030 data was found for the year ranging from 2011 to 2021. The various document types are as under:

- Articles – 2354;
- Paper proceedings – 210;
- Reviews - 194;
- Meeting Abstract – 182;
- Editorial material – 80;
- Book chapters – 6; and
- Letters - 4

Figure 4 presents a comprehensive overview of the document distribution within the dataset. The analysis reveals that articles constitute the predominant category, comprising over a quarter (25%) of the corpus. Proceedings papers closely follow at 21%,

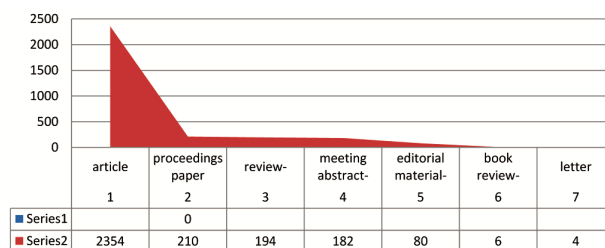


Fig: 4 — Documents Types

underscoring their significance. Reviews contribute significantly at 18%, while meetings abstracts and editorial materials account for 14% and 11%, respectively. Book reviews constitute 7% of the dataset, indicating a less pronounced presence. Finally, letters are the least prevalent category, comprising a mere 4%, suggesting their limited representation in the dataset, thus offering valuable insights into the composition of the document types in this context. Within the Web of Science database, articles are the predominant document type pertaining to paramedic research. These articles extensively cover various aspects of the paramedic profession, including advanced practices, protocols, and research aimed at enhancing patient care and outcomes^{11,12}.

VOSviewer software update in September 2021 and latest version was 1.6.15, a widely-used tool for bibliometric and network analysis. However, for the most up-to-date version, was used to analyse funding agencies, collaboration and keyword co-occurrence mapping. VOSviewer software was employed for in-depth analysis in the study, focusing on mapping funding agency networks, collaboration patterns, and keyword co-occurrences. This powerful tool facilitated the visualization and exploration of research relationships, enabling a comprehensive understanding of the research landscape and its key components.

Funding Agencies

Funding agencies are crucial for paramedics as they provide financial support for research, equipment, training, and infrastructure development. Their involvement ensures the advancement of paramedic practices promotes innovation and enables the delivery of high-quality pre-hospital care to improve patient outcomes¹³. Funding agencies are crucial in paramedics as they provide financial support for research, equipment, training, and infrastructure development. Their involvement ensures the advancement of paramedic practices promotes innovation and enables the delivery of high-

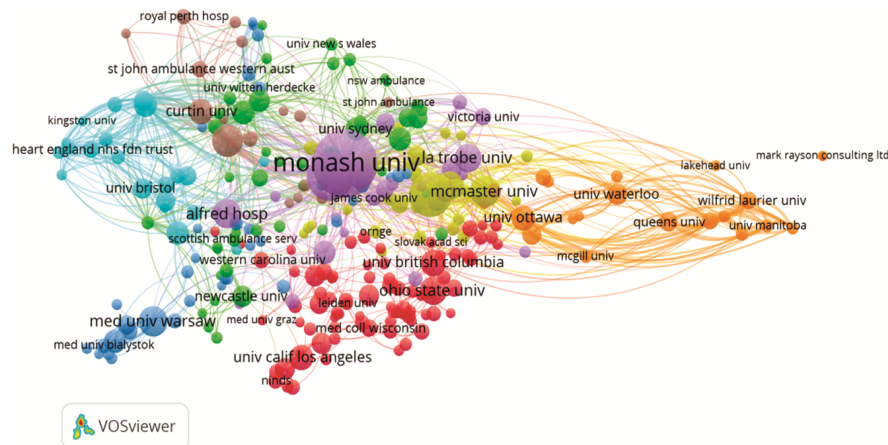


Fig: 5 — Funding Agencies

quality pre-hospital care to improve patient outcomes¹⁴

In figure-5, analysis has revealed that the funding in majority of the publications was funded by international agencies and universities.

The top 10 funding agencies are -

1. US Department of Health Human Services
2. National Institutes of Health - United States of America
3. National Institutes of Health and Care Research NIHR U.K.
4. Canadian Institute of Health Research CIHR
5. National Health and Medical Research Council - Australia
6. NIH National Heart Lung Blood Institute NHIBI U.S
7. European Commission
8. UK research Innovation UKRI
9. NIH National Centre for Advancing Translational Sciences NCATS, Bethesda, Maryland.
10. Medical Research Council UK

Funding agencies are vital for the study of paramedic research. They provide essential resources, enable extensive data collection, support advanced technology, recruit skilled personnel, ensure ethical standards, enhance dissemination, sustain long-term research, and maintain objectivity¹⁵. Their role is pivotal in advancing paramedics and improving emergency medical services.

Collaboration

Paramedic research plays a vital role in advancing pre-hospital care, improving patient outcomes, and guiding evidence-based practices. It has the potential

to bridge gaps in healthcare and promote equitable access to quality emergency medical services. Further investment in paramedic research is essential for continuous improvement and innovation in this critical field. Partnership between countries and organizations is essential to create global networks¹⁶ this will enable global collaborative Research, which is quite common in many domains nowadays. International collaborative research will enable knowledge sharing and building teams using a common platform to share research interests, perform research, promote research and publish findings¹⁷

The findings on Collaboration in Figure-6 suggest that independent authors from almost 12 countries have collaborated directly or indirectly, and 6 clusters could be mapped. The analysis also suggests that various Authors have frequently collaborated with the authors in the United States of America, with almost 795 publications and 598 citations. It is followed by Australia, Canada, England, Germany, Poland and & France with 498, 380, 328, 279, 137 & 69 publications, respectively with more than 150 citations. More so, the mapping further suggests that in the year 2012, the USA aggressively collaborated with countries like Australia, England and Germany. Only in the very recent years India has collaborated with these countries.

Collaboration between countries is crucial in the study of paramedic research for several reasons. It fosters the exchange of diverse perspectives, methodologies, and resources, enriching the research process. Additionally, it enables the adaptation of best practices from different healthcare systems, leading to more comprehensive and globally applicable findings that can benefit patient care worldwide^{18,19}.

Keywords co-occurrence mapping

Keywords are important in paramedic research as they help in indexing and categorizing the study, making it easily discoverable by researchers and practitioners. They enhance the search ability of relevant literature, facilitate literature reviews, and ensure that the research aligns with the specific focus and objectives of paramedic practice²⁰.

The search on ‘Keywords’ has a significant role in indexing publications. Through this mechanism, researchers are able to find the most apt research articles/publications in the various databases across the web. In the instant study, in figure-7, a total of 649 keywords have been filtered as author keyword co-occurrences and a total of 588 keywords were filtered

having 10 clusters. The most used keywords were ‘emergency medical service’, ‘Paramedic’, ‘paramedics training communication and outcome’ and ‘health and hygiene’.

Keywords are essential in the study of paramedic research as they succinctly represent the core themes and focus of the study. Well-chosen keywords enhance discoverability, aiding researchers, practitioners, and policymakers in locating relevant research. They streamline information retrieval, facilitating knowledge dissemination and fostering collaboration in the field of paramedics.

Discussion

In the realm of network visualization, India stands as a focal point, exhibiting a singular cluster amidst a vast web of scholarly discourse. Within this intricate network, India boasts 25 pivotal links, interconnecting 28 meticulously registered documents. Amidst this intellectual tapestry, an impressive total of 649 distinct keywords emerge through author keyword co-occurrences. Subsequently, meticulous filtration reduces this extensive lexicon to a refined selection of 588 keywords, artfully categorized into 10 distinct clusters. Notably, the keywords Paramedic and Emergency Medical Service. The Indian researchers has only 31 publications in the core collection of the Web of Science [figure-8]. The Indian researchers publish 29 review article and 2 proceeding paper in 2018 & 2019 in these topics.

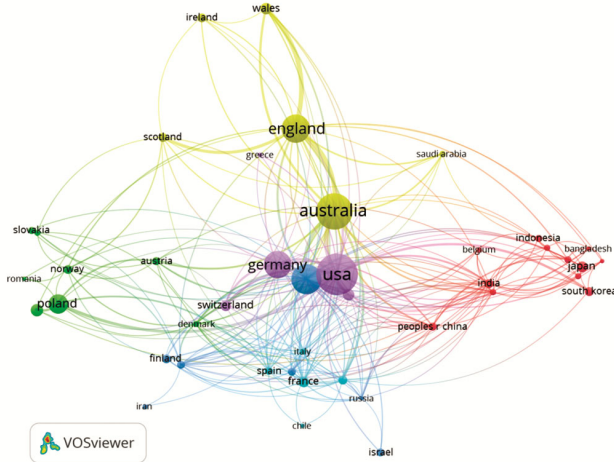


Fig: 6 — International Collaboration

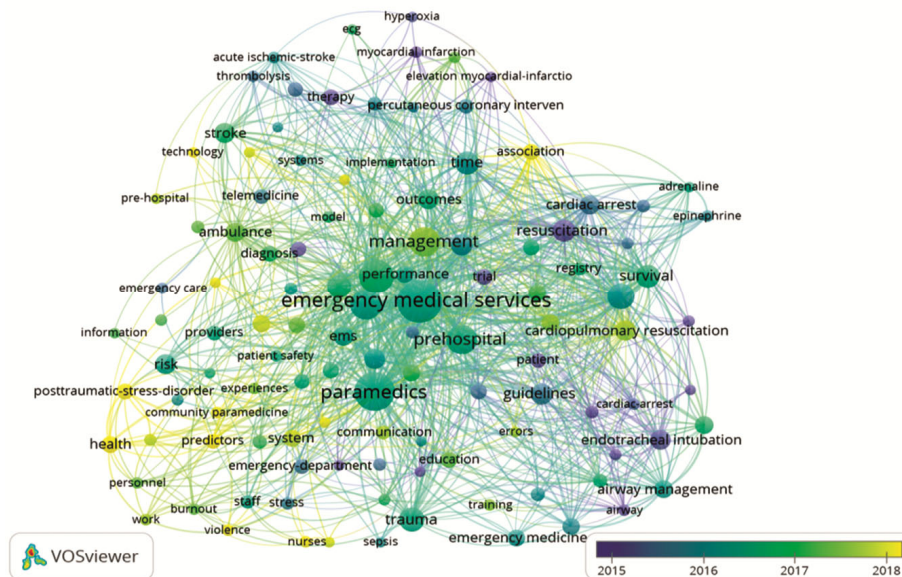


Fig: 7 — Keywords co-occurrence(author keywords)

2011	2	Healthcare Professional
2102	2	Medical Practitioner
2013	1	Healthcare Sciences
2014	3	Paramedical Science
2015	2	Emergency Medical Care
2016	4	Medical Health Care
2017	4	Healthcare Service
2018	3	Public Environment Occupational Health
2019	6	Emergency Medicine
2020	3	Healthcare Science Medicine
2021	1	Healthcare Preparedness

Fig 8 — Indian research publications in the core collection of web of science

The presence of only 31 publications by Indian researchers in the core collection of the Web of Science is indeed concerning, emphasizing the urgent need for a substantial boost in scholarly publications and research efforts in India. This scarcity can be attributed to various challenges, as highlighted in the analysis. These challenges encompass the lack of promising career prospects, limited opportunities for professional advancement, inadequate compensation structures, demanding working conditions, and the perceived occupational risks associated with the paramedic profession^{21, 22}. It is crucial to address these formidable issues to stimulate greater interest and research activity in the field of Paramedics, thereby fostering growth and innovation in healthcare services within India²³. In this new era of globalization of education, the Government of India is also allowing and promoting privatizing in education on the pattern of the West. Of late, it is also seen that the Indian Government is also promoting non-government organizations like organised trusts, companies, self-help groups, not for profit charitable associations to come forward to meet the need for medical health care by creating job-oriented courses and training²⁴. Therefore, the Indian Para Medical Council has now decided to bridge the gap to meet the growing demand for paramedics from Hospitals. Pathological & diagnostic laboratories, nursing homes, trauma centres, clinics etc. The aim is to overcome the gaps by providing quality, modern and affordable education to young paramedics²⁵.

Paramedic research plays a vital role in advancing pre-hospital care, improving patient outcomes, and guiding evidence-based practices. It has the potential to bridge gaps in healthcare and promote equitable access to quality emergency medical services. Further investment in paramedic research is essential for

continuous improvement and innovation in this critical field^{25, 26}.

Conclusion

In this Study of paramedic research, a quantitative assessment provides crucial about practice and training with implications for India's context. The persistent data challenges emphasize the necessity for continued research in this vital field within the Indian healthcare landscape. As paramedic evolves, on-going quantitative assessments stand to play a pivotal role in enhancing patient care and potentially saving lives in the Indian context. The necessity for Indian researchers to actively engage in paramedic research, particularly through demanding quantitative assessments, is of paramount importance. This committed involvement possesses the potential to catalyse a profound transformation in the quality of emergency medical services in India. Through the generation of invaluable insights, evidence-based practices can be formulated and put into action, leading to improved patient outcomes and heightened efficiency within the healthcare system. Embracing this avenue of research is not merely an academic pursuit but a moral responsibility aimed at starting positive change in the realm of paramedics.

Therefore, there is an urgent need to provide a major boost to scholarly publications and research in this area in India.

It reflects the positive push by the authorities and policy planners to boost this area of research where India had indeed leading strength for ages.

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