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Medical device related pressure injuries as an issue of increasing awareness in intensive care units: a bibliometric analysis of global trends

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ABSTRACT

Aims: Medical device related pressure injuries (MDRPI) are a patient safety issue that is gaining increasing recognition and attention, particularly in intensive care units (ICUs). This study aims to identify research trends related to MDRPI and to map the scientific collaboration network.

Methods: A bibliometric analysis was conducted on September 21, 2026, using the Web of Science (WoS) Core Collection as the database. Publications classified as articles and review articles from the period 2010-2026 were included. Publication characteristics, authors, institutions, journals, research areas, and citations were analyzed. The VOSviewer analysis network was used to visualize keyword co-occurrence, co-authorship, and journal analyses.

Results: A total of 308 publications meeting the criteria were included in the study. The highest number of publications was recorded in 2021 (n=43, 13.96%). The publications received a total of 5488 citations, and the h index was 38. The USA leads in publication output with 67 publications (21.75%). Among WoS categories, nursing stood out with 51.62%; Amit Gefen was the most productive author with 17 publications, and the International Wound Journal ranked first among journals with 36 publications. Keyword analysis revealed seven thematic clusters, with pressure injury and medical device related pressure injury serving as the central themes.

Conclusion: MDRPI is a topic that has gained increased awareness, particularly following the COVID-19 pandemic. Studies focused on intensive care and prevention protocols will become the focal point for the development of algorithms. Multicenter, interdisciplinary studies will guide the establishment of standards for MDRPI prevention and management.

Keywords: Pressure ulcer, intensive care units, bibliometrics, patient safety, nursing

INTRODUCTION

Medical device related pressure injuries (MDRPI) have become an increasingly prominent issue in intensive care units (ICUs) in recent years, posing a threat to patient care and safety.[1] ICUs are settings where patients with various life threatening critical illnesses particularly respiratory failure and hemodynamic instability are monitored and treated. While advancements in medical technology, the development of new medical devices, and the enhancement of intensive care capabilities and monitoring standards are crucial for patient management, they also give rise to certain medical issues and complications. Although medical devices such as endotracheal tubes, central venous catheters, non invasive ventilation masks, arterial monitoring lines, nasogastric tubes, urinary catheters, orthoses, and compression stockings are indispensable components of intensive care, their extensive use has increased the incidence of device related pressure injuries.[2-4]

Pressure injuries generally refer to tissue damage resulting from prolonged pressure on the skin and subcutaneous tissues, typically over bony prominences. While these injuries usually arise from immobility and external pressure, MDRPI occurs as a result of direct contact between the mucosa or skin and the shape and rigidity of a device, leading to localized edema and perfusion impairment.[5,6] ICU patients are at risk for MDRPI development due to factors such as

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sedation or altered states of consciousness and alertness, immunosuppression, malnutrition, the need for vasopressors, tissue and extremity edema, and hypoperfusion.[7]

Beyond merely being a source of pain and an aesthetic concern for patients, MDRPI presents clinicians with risks such as increased infection rates, a greater need for mechanical ventilation and vasopressors, prolonged ICU and hospital stays, and elevated morbidity and mortality rates.[5,8] Consequently, the preventability of MDRPI has become a significant indicator regarding both patient safety and the delivery of optimal, high quality healthcare services.

The recent increase in academic publications concerning MDRPI particularly following the COVID-19 pandemic highlights the importance of nursing care and wound management.[9] Growing awareness and research activity create a need to investigate global trends in MDRPI, document the evolution of patient management innovations, foster international collaborations, and identify the researchers and research efforts focused on this subject.

While MDRPI are of particular concern in ICUs due to factors such as critical illness, immobilization, the widespread use of invasive medical devices, and the administration of sedation they are not limited to patients in intensive care. Patients in other settings, including acute care units, dermatology wards, physical therapy and rehabilitation departments, and wound care units, may also be at risk of developing MDRPI if medical devices are used in their care. Consequently, a thorough examination of the scientific literature on MDRPI requires the review and analysis of research conducted across various clinical settings, rather than focusing solely on publications centered on intensive care.

Bibliometric analysis is a research approach that aims to evaluate the scientific output, development trends, and intellectual structure of a specific research field through the quantitative examination of bibliographic data from scientific publications. It enables the study of performance metrics such as publication counts and citation indicators as well as patterns of collaboration among authors, institutions, and countries, the relationships between keywords, and the distribution of research themes. Consequently, it is used to assess interdisciplinary connections and identify focal topics for future research.[10,11]

Accordingly, the aim of this study is to present a detailed bibliometric analysis of MDRPI publications indexed in the Web of Science (WoS) Core Collection; to identify the institutions, authors, and research areas concentrating on this topic; to visualize scientific network maps; and to provide guidance for future research themes.

METHODS

Ethics

This bibliometric analysis is based solely on publicly available data from the WoS Core Collection. The study did not involve patient data, human participants, or animal experiments; therefore, ethics committee approval and informed consent were not required. The study was conducted in accordance with ethical rules and principles.

Data Source Selection and Search Method

The WoS Core Collection database was utilized for this bibliometric analysis. It was selected as the sole, objective database due to its provision of comprehensive author and citation data, detailed publication indexing, and adherence to high scientific standards regarding publication quality. This approach prevented the duplication of records from multiple databases and avoided complications arising from inconsistent data formats. Furthermore, it ensured standardization in citation mapping; this not only provided a citation architecture compatible with VOSviewer but also facilitated appropriate mapping for the bibliometric analysis.

An advanced search mode and the "Topic" (TS) field were utilized for the search. Searches were conducted across titles, abstracts, keyword plus, and author keywords. To verify the relevance of the records retrieved from the search to the MDRPI, the titles and abstracts of the publications were evaluated; in cases where relevance was unclear, the full texts were examined. Publications directly related to the MDRPI were included in the study. The logical operator "OR" was employed to ensure comprehensive coverage of the literature and to avoid missing any relevant publications. The search query was structured as follows: TS=("medical device related pressure injuries" OR "medical device related pressure ulcers" OR "medical device related pressure injury" OR "medical device related pressure ulcer" OR "device related pressure ulcer" OR "device related pressure ulcers" OR "device related pressure injuries" OR "device related pressure injury" OR "MDRPI" OR "MDRPU").

The literature search was conducted on September 21, 2026. No language restrictions were applied; publications in all languages were included in the study. Studies classified as articles and review articles were included, whereas other types of publications and retracted articles were excluded. Publications indexed in the Science Citation Index Expanded (SCIE) and Emerging Sources Citation Index (ESCI) within the WoS database were included. No time restrictions were applied, with the aim of including publications from all time periods.

Data Analysis and Analysis Tools

The scanned publications were examined under the subheadings of publication years, document types, researcher profiles, authors, WoS categories, WoS indices, affiliations, departmental affiliations, publication titles, languages, countries, publishers, author keywords, and research areas. Additionally, citation counts for the publications were analyzed by year. This analysis determined the total number of publications and total citations, as well as the average number of citations per publication and the h index. The h index was defined as the highest number h such that there are h publications, each having received at least h citations.

Visualization, Mapping, and Network Analysis

VOSviewer (version 1.6.20, Leiden University, Netherlands) was used to visualize and map the data obtained in the study. In this context, analyses regarding author co-authorship, co-occurrence of words or citations, author keyword linkages,

country and institution density maps and connections were visualized.[12] The full counting method was applied to all networks, while link strength was normalized using the association strength method. For the author level co-authorship analysis, a threshold of at least three publications per author was applied; for the keyword co-occurrence analysis, a minimum of five occurrences was required for each author keyword. Data were extracted from the WoS database in the full record and cited references format as tab delimited files and subsequently processed using Python (v3.12) and Microsoft Excel to generate descriptive statistics and visual charts.

RESULTS

A total of 308 publications meeting the criteria were analyzed in this study. Although there were no time restrictions, the earliest publication identified was from 2010; consequently, the study analyzed publications from the period of 2010-2026. While there was only one publication in 2010, the highest number of publications (43; 13.96%) appeared in 2021. Of the publications, 263 (85.39%) were research articles, and 45 (14.61%) were review articles. Regarding language, 307 (99.675%) publications were in English, while only one (0.325%) was in Korean. Of all publications, 272 (88.31%) were indexed in the Science Citation Index Expanded (SCI-E), and 36 (11.69%) were indexed in the Emerging Sources Citation Index (ESCI). An analysis of the countries of origin revealed the top five to be the United States of America (USA), the People's Republic of China, Turkiye, Australia, and Israel, in that order. The USA accounted for the highest number of publications (67; 21.75%), followed by the People's Republic of China (62 publications) and Turkiye (41 publications). An examination of WoS categories showed that more than half of the publications (159; 51.62%) fell within the field of nursing. This was followed by dermatology (39.61%), surgery (22.72%), and critical care medicine (8.76%). The general distribution characteristics of the publications are presented in Table 1.

Table 1. General characteristics of the publications

Characteristics	n (%)
Total number of publications	308 (100)
Publication years	
2026*	39 (12.66)
2025	41 (13.31)
2024	38 (12.34)
2023	37 (12.01)
2022	28 (9.09)
2021	43 (13.96)
2020	27 (8.77)
2019	18 (5.84)
2018	11 (3.57)
2017	11 (3.57)
2016	4 (1.30)
2015	4 (1.30)
2014	3 (0.97)
2013	1 (0.32)
2012	2 (0.65)
2010	1 (0.32)
Document types	
Article	263 (85.39)
Review article	45 (14.61)
Web of Science Index	
SCI-E	272 (88.31)
ESCI	36 (11.69)
Languages	
English	307 (99.675)
Korean	1 (0.325)
Countries (top 5)	
USA	67 (21.75)
People's Republic of China	62 (20.13)
Turkiye	41 (13.31)
Australia	26 (8.44)
Israel	21 (6.81)
Web of science categories (top 5)	
Nursing	159 (51.62)
Dermatology	122 (39.61)
Surgery	70 (22.72)
Critical care medicine	27 (8.76)
Medicine general internal	18 (5.84)

*Data for the year 2026 covers publications indexed in the WoS Core Collection database up to September 21, 2026. Therefore, this should be taken into account when making comparisons with previous years. SCI-E: Science Citation Index Expanded, ESCI: Emerging Sources Citation Index, USA: United States of America

Annual Publication Distributions and Citation Relationship

A literature review revealed that while the first publication concerning MDRPI appeared in 2010, the annual number of publications did not exceed five until 2017. Double digit figures were reached in 2017 with 11 publications, and the upward trend continued, and peaked in 2021 with 43 publications. This was followed by 41 publications in 2025, while 2026 ranks third with 39 publications, despite the year not yet having concluded (Table 1). The number of publications for 2026 reflects records indexed up to September 21, 2026 the date the database search was conducted and therefore represents data for an incomplete calendar year.

A total of 2187 publications cited these 308 papers; excluding self citations, this figure stands at 1909. The total number of citations received by these papers is 5488, or 3282 when self citations are excluded. The average number of citations per publication is 17.82, and the h index is 38. Similar to publication counts, citation numbers have also risen, particularly since 2018; the highest citation count 953 was recorded for 2026 on the day of the search, even though the year is still ongoing. This was followed by 2024 with 883 citations and 2025 with 852 citations. A significant increase in both publication and citation numbers is evident, particularly over the last five years; the relationship between citation counts and publication numbers over the years is illustrated in Figure 1.

Most Cited Publications

The most highly cited publication is the article titled "Medical device related pressure ulcers in hospitalized patients" published by Black et al.[6] in the International Wound Journal in 2010. This publication holds the distinction of being the first to meet the screening criteria for MDRPI while also

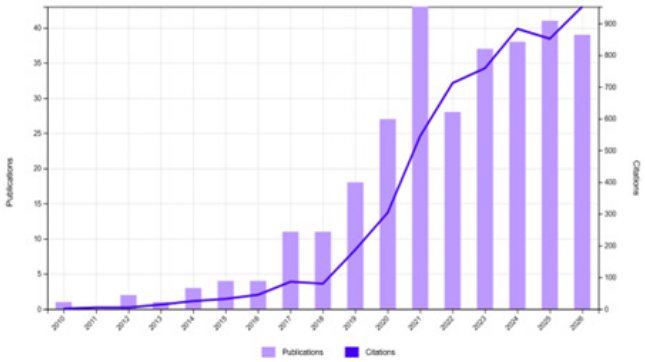

Figure 1. Relationship between publication and citation counts over the years. (Data for the year 2026 reflects records indexed up to September 21, 2026; the data for this year pertains to an incomplete calendar year)

being the most cited, with 271 citations. Ranking second is the study titled "Pressure Injury" published by Hajhosseini et al.[5] in the Annals of Surgery in 2020, with 204 citations. Following in the ranking is the study titled "Medical device-related pressure ulcers: A systematic review and meta-analysis" published by Jackson et al.[13] in the International Journal of Nursing Studies in 2019, with 180 citations. The top 10 most cited articles are presented in Table 2.

Guiding Publications and Authors

Among the most prolific authors, Amit Gefen[9] holds the undisputed top spot with 17 publications. Gefen[9] is followed by Fiona Coyer with 7 publications, while three authors Ayişe Karadağ, Ann-Marie Nie, and Münevver Sönmez rank consecutively with six publications each, securing significant positions in the MDRPI research literature. Consequently, reflecting Amit Gefen's background as a biomedical engineer, Tel Aviv University's Iby and Aladar Fleischman Faculty of Engineering emerged as the institution with the highest number of publications. This was followed by the Queensland University of Technology's Faculty of Health, associated with Fiona Coyer. Koç University School of Nursing ranks third among institutions, corresponding to the third place ranking of its faculty member, Ayişe Karadağ. These findings align with the country level analysis, in which Turkiye, Australia, and Israel appear among the top five nations. Furthermore, an analysis of the journals reveals that the International Wound Journal published the highest number of articles on MDRPI, with 36 publications (11.68% of the total). The Journal of Tissue Viability ranked second with 33 publications, followed by Advances in Skin & Wound Care in third place with 21 publications. Overall, the publication activities of these journals appear consistent with the characteristics and general nature of both the subject matter and the field of study; journals specializing in wound care, nursing, and critical care were notably preferred. Table 3 lists the top ten authors and the top ten journals by publication volume, while Figure 2 presents the VOSviewer co-authorship network map at the author level. The relationships and clusters among the journals are visualized in Figure 3. A bibliographic coupling analysis was conducted to evaluate the bibliometric relationships among journals. In this analysis, nodes represent journals, while the connections between them represent bibliometric relationships based on bibliographic coupling. The visualization of the network has enabled the assessment of the relationships between journals and the publication patterns within the research field.

Keyword Co-occurrence Analysis

Keyword co-occurrence mapping in VOSviewer (minimum: 5 occurrences) revealed seven main thematic clusters (Figure 4). The size of the circles indicates the frequency of the term in the literature, while the lines between the circles represent the intensity of co-occurrence within the same studies. The largest circle at the center of the network represents "pressure injury". Different colors represent groups of terms that are frequently associated with one another. The yellow cluster forms the core of the subject matter, comprising terms such as "pressure injury", "medical device related pressure injury", "intensive care", "nursing", "prevention", and "risk factor". It focuses primarily on pressure injuries and MDRPI in ICUs, as well as the practices and approaches of nurses and other healthcare professionals regarding this issue. While the purple cluster groups assessments concerning pediatric and neonatal patient populations, the red cluster reflects the intersection of MDRPI

Table 2. The top 10 most cited publications on medical device related pressure injuries

Rank	Authors (year)	Title	Journal	Citations
1	Black et al. (2010)[6]	Medical device related pressure ulcers in hospitalized patients	Int Wound J	271
2	Hajhosseini et al. (2020)[5]	Pressure Injury	Ann Surg	204
3	Jackson et al. (2019)[13]	Medical device-related pressure ulcers: a systematic review and meta-analysis	Int J Nurs Stud	180
4	Kayser et al. (2018)[14]	Prevalence and analysis of medical device-related pressure injuries: results from the international pressure ulcer prevalence survey	Adv Skin Wound Care	143
5	Gefen and Ousey. (2020)[9]	Update to device-related pressure ulcers: SECURE prevention. COVID-19, face masks and skin damage	J Wound Care	113
6	Coyer et al. (2014)[3]	A prospective window into medical device-related pressure ulcers in intensive care	Int Wound J	113
7	Barakat-Johnson et al. (2019)[15]	The incidence and prevalence of medical device-related pressure ulcers in intensive care: a systematic review	J Wound Care	108
8	Alshahrani et al. (2021)[16]	Nursing interventions for pressure injury prevention among critically ill patients: a systematic review	J Clin Nurs	102
9	Jiang et al. (2020)[17]	The prevalence, characteristics, and prevention status of skin injury caused by personal protective equipment among medical staff in fighting COVID-19: a multicenter, cross-sectional study	Adv Wound Care (New Rochelle)	98
10	Barakat-Johnson et al. (2017)[18]	Medical device-related pressure injuries: an exploratory descriptive study in an acute tertiary hospital in Australia	J Tissue Viability	97

SECURE: Skin/tissue, education, champion/collaborate, understanding, report, evaluate

Table 3. Guiding journals and authors

Rank	Authors (top 10)	Publications n (%)	Rank	Journal (top 10)	Publications n (%)
1	Gefen, Amit	17 (5.51)	1	International Wound Journal	36 (11.68)
2	Coyer, Fiona	7 (2.27)	2	Journal of Tissue Viability	33 (10.71)
3	Karadağ, Ayişe	6 (1.94)	3	Advances in Skin Wound Care	21 (6.81)
4	Nie, Ann-Marie	6 (1.94)	4	Journal of Wound Ostomy and Continence Nursing	18 (5.84)
5	Sönmez, Münevver	6 (1.94)	5	Journal of Clinical Nursing	15 (4.87)
6	Erbay Dallı, Öznur	5 (1.62)	6	Journal of Wound Care	11 (3.57)
7	Worsley, Peter	5 (1.62)	7	Intensive and Critical Care Nursing	10 (3.24)
8	Bahar, Arzu	4 (1.29)	8	Wound Management Prevention	10 (3.24)
9	Bai, Yuxuan	4 (1.29)	9	Nursing in Critical Care	6 (1.94)
10	Barakat-Johnson, Michelle	4 (1.29)	10	Frontiers in Medicine	5 (1.62)

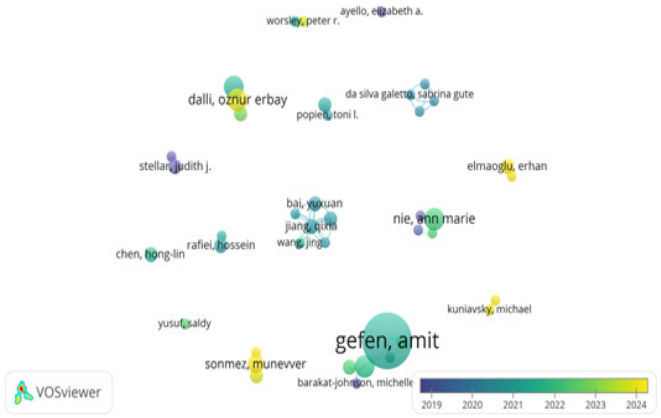

Figure 2. VOSviewer co-authorship network map at the author level. Each circle represents a single author, and the size of the circle corresponds to the number of publications. The connecting lines between the circles reflect the strength of collaboration. The map indicates that the authors work in small, isolated groups rather than within a large, unified network
VOSviewer: Visualization of similarities viewer

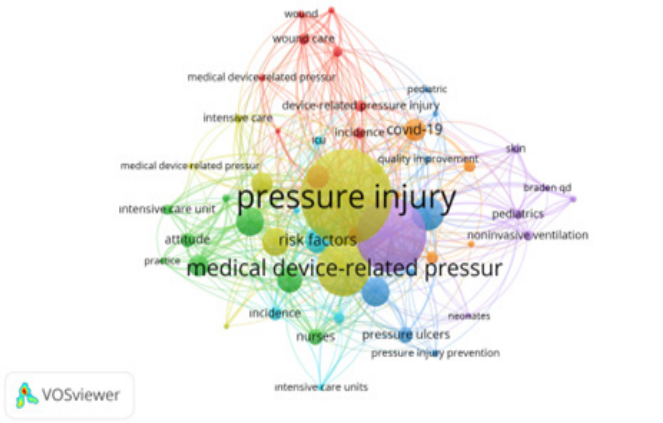

Figure 4. VOSviewer keyword co-occurrence network map. While the size of the circles reflects keyword frequency, the connecting lines indicate the strength of the co-occurrence between the words
VOSviewer: Visualization of similarities viewer



Figure 3. VOSviewer network map showing bibliographic coupling relationships between journals. While each circle represents a journal, the size of the circle and the text indicates the respective journal's weight within the dataset
VOSviewer: Visualization of similarities viewer

and wound care management. The orange cluster highlights studies examining the relationship between MDRPI and the increased use of medical devices during the COVID-19 pandemic. Furthermore, while the green cluster highlights the attitudes and practices of healthcare professionals in ICUs regarding the use of protective equipment and devices, the blue cluster focuses on sensitive patient groups such as pediatric patients and encompasses prevention strategies. The turquoise cluster, meanwhile, prioritizes incidence reporting specifically within the context of intensive care.

DISCUSSION

This study presents a comprehensive bibliometric analysis based on a detailed examination of the literature regarding MDRPI within the WoS Core Collection. By evaluating 308 publications indexed between 2010 and 2026 that met the study criteria, the research outlines the evolution and current distribution of MDRPI related literature while identifying indicators of future trends. Through a systematic and holistic analysis of influential authors, collaboration networks, institutions, and key research themes, the study highlights the enrichment of the literature and emphasizes the importance of raising awareness across the disciplines of dermatology, intensive care, nursing, and wound care.

The study reveals that while the first publication in the field of MDRPI appeared in 2010 with fewer than five publications released up to 2017 there was a marked upward trend, peaking at 43 publications in 2021.[6] The increase in publications during this period is noteworthy because it coincides temporally with the COVID-19 pandemic. While the increase in publications seems to align with the period when the pandemic affected intensive care monitoring and significantly altered the use of medical devices, a direct causal relationship

cannot be established. The pandemic may have made the clinical significance of MDRPI and other pressure injuries more visible, highlighting the need for careful monitoring and preventive measures in critical care settings.[19] The global deployment of invasive and non invasive mechanical ventilation systems, the widespread adoption of high flow oxygen therapy, and the prolonged use of oxygen masks and endotracheal tubes during the pandemic had adverse effects on skin integrity. In addition to the prolonged use of medical devices, prone positioning and immobility posed significant challenges regarding both pressure injuries and MDRPI.[20,21] In this context, the annual publication trend observed in the research confirms that MDRPI gained greater visibility in the medical literature during and after the COVID-19 pandemic. Furthermore, publications related to COVID-19 by Gefen and Ousey[9] and Jiang et al.[17] hold a significant place in the MDRPI literature due to their high citation counts and align with the findings of this study.

Supporting this perspective from a different angle, two separate studies published in 2019 one by Jackson et al.[13] and another by Barakat-Johnson et al.[15] conducted prior to the COVID-19 pandemic noted that MDRPI incidence and prevalence rates vary significantly and exhibit high heterogeneity. In their review, which focused specifically on intensive care patients, Barakat-Johnson et al.[15] highlighted that although MDRPI is a clinically significant issue, a lack of standardization persists regarding staging, definition, data collection, and reporting methods. Both studies emphasized the need for future research to better elucidate the subject and underscored the necessity of standardized data collection and processing. In this context, this bibliometric analysis can contribute to addressing this gap in the literature by mapping existing publications, identifying interrelationships, and highlighting key areas of interest and emerging trends. Consequently, the increase in publications observed over the years can be interpreted not merely as a rise in the disease burden, but rather as a reflection of improved problem definition, heightened clinician awareness, and the issue's growing prominence within the literature.

While this analysis reveals a significant increase in the number of publications particularly after 2018 substantial growth in citation counts has also been observed. A total of 5488 citations were recorded for the 308 publications identified during the search period, and the h index was determined to be 38. These results indicate that the subject has become a focal point of research interest, evidenced by the rise in both publication and citation numbers. The study by Black et al.[6] played a pioneering role; not only was it the first study identified in the search, but with 271 citations, it also underscored the fact that MDRPI is a distinct entity separate from conventional pressure injuries. Although it may appear to have a citation advantage over more recent publications, it should be recognized as a cornerstone of the MDRPI literature and a valuable resource when outlining the key aspects of the topic. Additionally, studies conducted by Jackson et al.[13] and Kayser et al.[14] stand out due to their high citation rates; both studies are significant in the context of international prevalence research. It has been highlighted that priorities for MDRPI research include epidemiological characterization, prevalence studies, and the synthesis of medical literature. In addition to the objective of determining prevalence, Coyer et al.[3] evaluated MDRPI in intensive care patients regarding its prevalence, anatomical location, etiology, and severity. Similarly, in a highly cited review focused on the intensive care setting, Barakat-Johnson et al.[15] noted that this issue is significant and warrants close attention within that environment. In their study, Black et al.[6] identified patients with edema or at risk of developing it, those with impalpable arterial pulses, and immobile patients unable to alert nurses to pain or compression caused by a device as being at risk for MDRPI, while emphasizing the importance of quality nursing care. Therefore, concepts such as nursing, intensive care, and wound care are not merely keywords but fundamental concepts regarding MDRPI.

Regarding the geographical distribution of publications, the United States, the People's Republic of China, Turkiye, Australia, and Israel constitute the top five countries. Research output is concentrated in specific nations, indicating that MDRPI research clusters around particular groups and academic centers. The United States naturally leads in these publications, supported by its robust and consistent infrastructure in nursing, patient safety, and wound care. The People's Republic of China remains a leading nation in publication output, driven by its scientific research capacity in recent years. Turkiye's position in third place is noteworthy, reflecting significant research activity in intensive care, wound management, and nursing services. It is evident that awareness of MDRPI is growing particularly in Turkiye and other nations alongside increasing efforts to establish and improve clinical practice standards. An analysis of the authors reveals that researchers such as Ayişe Karadağ and Münevver Sönmez are among the most prolific, with a specific focus on nursing and the MDRPI field. Similarly, Amit Gefen leads the list with 17 publications, having made the most significant contribution to the literature by synthesizing his work in biomedical engineering with the field of MDRPI. These findings demonstrate that MDRPI research lends itself to a multidisciplinary approach, with the fields of nursing and biomedical engineering playing a major role in raising awareness. Consequently, the works of these authors serve as valuable guides for future researchers.

However, it is also necessary to note the following: although the authors have produced numerous significant publications, an examination of VOSviewer co-authorship analyses reveals that they tend to work within small, isolated groups rather than engaging in collaborative, joint, and organized publishing efforts. This situation may well motivate future researchers in this field and pave the way for multicenter, international, and large scale collaborative studies.

When the WoS categories of the studies included in the bibliometric analysis were examined, more than half of the publications fell within the nursing field, followed by dermatology at 39.61%. While this was an expected finding, it illustrates that research on MDRPI primarily focuses on skin integrity, wound assessment, care processes, and nursing monitoring. Given that MDRPI is associated not only with device related factors but also with issues such as vasopressor use, the need for mechanical ventilation, edema, immobility, and prone positioning in intensive care patients, the field of

critical care medicine currently representing 8.76% of the studies may attract greater research interest in the future.[22] The journal analysis aligns with these findings; while a multidisciplinary structure is maintained, journals focused on nursing, wound care and management, tissue and skin integrity, and intensive care predominate. Given the multidisciplinary nature of the subject, while this study considers ICUs as settings of high clinical significance for the prevention and management of MDRPI, the bibliometric analysis is not limited solely to ICU patients. The analysis also encompasses publications related to MDRPI conducted in various other clinical settings, provided they meet the established search strategy and inclusion criteria. Consequently, the findings reflect the overall scientific structure of the MDRPI literature rather than representing publication trends specific exclusively to intensive care. An examination of the inter journal relationship network reveals strong citation and content linkages between journals focused on wound management and care and those dedicated to critical care nursing. This research focus can serve as a guide and provide direction for new researchers in the field.

In the keyword co-occurrence analysis, the term "pressure injury" sits at the center of the network. Terms such as "medical device related pressure injury", "intensive care", "nursing", "prevention", and "risk factor" are clustered together, indicating that the primary research focus lies in the development of risk assessment and prevention algorithms for intensive care patients.[23] The VOSviewer analysis reflects a vision centered on taking necessary preventive measures before a wound develops, rather than treating it after it has occurred. Given the existence of distinct thematic clusters, future research may take shape around various topics; while intensive care and risk factors will remain high priority and relevant, studies may also concentrate or specialize in areas such as vulnerable patient groups, device management and wound care, and the COVID-19 pandemic.

In light of all these analyses, MDRPI is a preventable patient safety issue. Both device related and patient related factors can play a role in its development. Factors such as hypoperfusion, the need for vasopressor agents, and edema can reduce tissue resilience, leading to varying degrees and locations of injury across different patients. Given that any medical device can potentially be the culprit, determining which patients and under what medical conditions are at higher risk for MDRPI will serve as a key starting point for future research. This is particularly relevant to intensive care practice. Each patient must be reevaluated daily regarding their general condition, level of consciousness, mobility, device dependency, and sedation status. Consequently, the importance of nursing care, knowledge, and patient management is undeniable. Training programs, informational initiatives, and strategic guidelines regarding nursing care in this area must be adopted and implemented.[24] Algorithms should be developed to prevent the occurrence of MDRPI. Practices such as individualized repositioning, frequent and early mobilization, moisture control, the use of thin dressings, and pressure relieving maneuvers must be adopted.[25,26]

MDRPI is a field of research in which the risks associated with medical devices used in various clinical settings as well as strategies for their prevention are gaining increasing importance. However, examining publication counts alone is insufficient to fully explain the structure of scientific output in this field, the collaborations among researchers, or the relationships between prominent themes. Bibliometric analysis and network visualization methods can contribute to a systematic examination of these relationships and provide an overview of the research landscape. Bibliometric analyses are used to reveal how scientific interest in specific diseases or clinical issues evolves over time, and to identify influential publications and research groups within the field.[27,28]

Although MDRPI has gained increasing visibility in the literature in recent years, it cannot be said to rest on a fully homogeneous foundation. Heterogeneous results may still arise due to factors such as a lack of clarity regarding incidence and prevalence rates, variations in patient populations and timing of assessments, and differences in device categories. As demonstrated by this bibliometric analysis, despite the rising number of publications over the years, a unified approach to data analysis remains elusive. Future prospective, multicenter, and comprehensive studies will provide greater clarity regarding the standardized definition, staging, and device classification of MDRPI, as well as its relationship with patient outcomes. ICUs could serve as the focal point for future research. Studies should adopt a multidisciplinary approach incorporating diverse stakeholders such as nurses, intensive care specialists, and biomedical engineers to pave the way for preventive and protective interventions. Furthermore, the early identification of high risk patients could be a key objective for the future. Accordingly, this bibliometric analysis aimed to chart a roadmap for future research by examining past studies on MDRPI and identifying areas of interest, trending topics, temporal changes, the boundaries of the research field, and key contributors shaping the literature.

Limitations

The study has certain limitations that should be noted. The bibliometric analysis was conducted using only the WoS Core Collection database; although a single database was selected to ensure data standardization and prevent duplicate entries, publications indexed in PubMed, Scopus, or other databases may have been excluded. Furthermore, the study included only articles and review articles, potentially limiting the representation of contributions from other publication types such as conference papers and book chapters. There were no language or date restrictions. The literature search was conducted as of September 2026; consequently, citation and publication counts by the end of 2026 may be higher, which could alter the ranking and priority of certain data. While bibliometric analyses examine various relationships and Networks primarily based on publication and citation counts they may not reflect the clinical quality or methodological differences of the studies.

CONCLUSION

Awareness and visibility regarding the subject of MDRPI have continued to increase in recent years. MDRPI represents a significant patient safety concern that reflects the quality of patient care. Although the field has historically evolved

around wound care, pressure injuries, and the fundamentals of nursing, future focus may shift toward areas such as intensive care, critical care, prevention protocols, and smart medical devices. In this context, intensive care based studies will not only address research gaps but also contribute to the standardization of definitions and reporting systems by fostering data homogenization. Collaborative, multicenter studies involving various institutions and countries rather than isolated, fragmented efforts will strengthen the global advancement of this field. Collaborative action among diverse disciplines including intensive care physicians, nurses, physiotherapists, and biomedical engineers will be crucial for the early recognition of MDRPI and the development of personalized risk assessments and prevention policies.

ETHICAL DECLARATIONS

Ethics Committee Approval

As this study is a bibliometric analysis based on data extracted from the Web of Science Core Collection, it did not involve human participants, patient data, or animal experiments; therefore, ethics committee approval was not required.

Informed Consent

This bibliometric study used only publicly available data and did not involve human subjects or personal information; therefore, informed consent was not required.

Peer Review Process

This manuscript was subject to external peer review.

Conflict of Interest

The author declares no conflicts of interest related to this study.

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Author Contributions

The author is solely responsible for the conception, data collection, analysis, and writing of this manuscript.

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