Current Debates in Clinical Decision Support Systems Research in the Field of Medical Informatics: What Text Mining Tell Us?

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Abstract

Medical informatics holds significant importance in today's healthcare systems. At its core, it aims to enhance the quality of healthcare services by ensuring the accurate, effective, and secure utilization of health data [1]. Additionally, this field is highly interdisciplinary and plays a critical role in the software industry. Given Turkey's strong position in the health sciences, fostering deeper collaboration with computer sciences could significantly strengthen its role in this domain [2,3,4,5].This study underscores the importance of medical informatics and seeks to identify prominent discussions in clinical decision support systems research using text mining methodologies. To achieve this, we analyzed research articles published between 2000 and 2024 in the Web of Science (WoS) database, collected on March 5, 2025. The study aims to highlight the key topics emerging in the field of clinical decision support systems. This project was developed as an outcome of the TÜBİTAK 2209-A research initiative. For the literature search, the keywords *"clinic decision support"** and *"clinical decision support"** were used to filter the relevant articles. The study employed R Bibliometrix Biblioshiny, VOSviewer, and Python programming language with libraries such as Scikit-learn, Gensim, and Wordcloud for data analysis.The findings indicate a growing interest in clinical decision support tools in the healthcare literature over the years. While only one article was published in 2000, the number increased to 170 articles in 2024, totaling 1,431 publications in this period. Turkey contributed 15 articles, ranking 23rd in the global literature.The analysis highlights that artificial intelligence and machine learning have emerged as critical tools in clinical decision support systems in recent years. Key topics identified in the field include primary care, quality improvement, pediatrics, emergency medicine, precision medicine, clinical guidelines, and computerized physician order entry systems. Furthermore, business intelligence tools proved highly useful in implementing and processing the data in this study [6,7]. Medical informatics is an area where Turkey should aim to strengthen its position significantly [1,4,5]. Similar to the advancements in the defense industry in recent years, it is imperative to extend this progress to the health sector. To achieve this, fostering stronger collaborations with fields such as materials science, fundamental sciences, electrical-electronics engineering, and computer sciences is of critical importance. Additionally, developing national scientific policies in this area is essential. Such initiatives will not only advance Turkey's healthcare system and establish a robust domestic market, but also enhance the country's competitiveness in the international market with proven and innovative medical technologies.
Keywords: Medical Informatics; Health Informatics; Clinical Decision Support Systems; Decision Support; Text Mining.

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* This study was supported by the TÜBİTAK 2209-A program.