

عنوان مقاله:

A study on the opportunities, challenges and applications of informatics in cancer research and clinical practice

محل انتشار:

یازدهمین کنفرانس بین المللی بهداشت، درمان و ارتقای سلامت (سال: 1401)

تعداد صفحات اصل مقاله: 12

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خلاصه مقاله:

Cancer refers to any one of a large number of diseases characterized by the development of abnormal cells that divide uncontrollably and have the ability to infiltrate and destroy normal body tissue. Cancer often has the ability to spread throughout your body. Cancer is the second-leading cause of death in the world. Oncology practises confront numerous hurdles in designing and implementing an informatics strategy, whether it is shifting from paper to electronic records or attempting to harness data from existing systems for outcome studies. With the rising costs of oncology treatments and anticipated changes in reimbursement laws, such as the necessity for evidence to back physician judgments, collecting data on treatment decisions and treatment efficacy will become critical to running a successful programme. This study assesses the current state of oncology informatics systems and focuses on building an informatics strategy to address the problems posed by anticipated changes in reimbursement rules as well as medical and information technology. Cancer informatics has significantly progressed in the big data era. We summarize the application of informatics approaches to the cancer domain from both the informatics perspective (e.g., data management and data science) and the clinical perspective (e.g., cancer screening, risk assessment, diagnosis, treatment, and prognosis). We discuss various informatics methods and tools that are widely applied in cancer research and practices, such as cancer databases, data standards, terminologies, high-throughput omics data mining, machine-learning algorithms, artificial intelligence imaging, and intelligent radiation. We also address the informatics challenges within the cancer field that pursue better treatment decisions and patient outcomes, and focus on how informatics can provide opportunities for cancer research and practices. Finally, we conclude that the interdisciplinary nature of cancer informatics and collaborations are major drivers for future research and applications in clinical practices. It is hoped that this review is instrumental for cancer researchers and clinicians with its informatics-specific insights.

کلمات کلیدی:

Cancer research, Oncology, Informatics, Healthcare, Medicine

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