Co-Designing Clinical Dashboards for Individual Patient Management in Oncology

Enhancing Individual Patient Health Data Visualization

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ABSTRACT

Effective visual representation of health data, which reduces the burden on healthcare professionals related to data management and interpretation, is crucial in the oncological field. We conducted a two-part qualitative study aimed at exploring and collaboratively designing optimal data visualizations of individual patients' health data for a clinical dashboard. Our preliminary findings emphasize the potential of clinical dashboards as access points to the patient's clinical process. Additionally, visualizing individual health data presents specific challenges that research teams should consider in future studies.

CCS CONCEPTS

• Human-centered computing~Visualization~Visualization techniques•Human-centered computing~Interaction design~Interaction design process and methods~User centered design•Human-centered computing~Interaction design~Interaction design process and methods~Participatory design

KEYWORDS

Data visualization, Data management, User experience, Co-design, Dashboards, Oncology

1 Introduction

The healthcare sector is known for generating vast amounts of information, especially following the widespread digitalization of healthcare services during the last decade. The need to process and present health data in ways that are useful to healthcare professionals, particularly to decision-making and monitorization of patients' health status, is an urgent and concerning issue.

Medical decision-making in oncology still heavily relies on the human interpretation of various diagnostic tests, such as blood analyses and imaging studies. Most of these records are received by doctors in written text formats and/or physical documents, placing a significant burden on healthcare professionals due to the need for data management and interpretation.

As a systemic pathology, cancer treatment requires collaboration among different healthcare professionals. Consequently, any technology developed to support medical decision-making for cancer patients must strike a delicate balance between providing a general interface that allows different healthcare professionals to make collaborative decisions while also ensuring the specificity and personalization necessary to reflect the unique aspects of each clinical area involved, as well as the individual characteristics of each patient. Moreover, the necessity to account for and represent the extended period from diagnosis to disease remission and the possibility of cancer recurrence adds an additional layer of complexity to the systems responsible for supporting and managing patient health information.

One resource that has been widely explored in recent years in the healthcare sector to support healthcare professionals in data management and interpretation, track progress, and aid medical decision-making is clinical dashboards. These digital interfaces leverage visual and functional features to provide users with rapid access to relevant information, offering a swift yet accurate overview of the presented data (1–3).

However, while these dashboards typically display aggregated data from multiple patients, the visual representation of individual patient information remains underexplored. Additionally, the need to monitor changes in oncology settings may also require the information and graphical techniques employed to evolve dynamically so data remains relevant to each phase of the patient's journey while also leveraging the most appropriate visual and graphical methods for effective data presentation.

Finally, the intensive and long-term use of clinical dashboards also requires a thorough analysis of the interaction experience (IX) provided by these interfaces (3,4). Although usability, user experience (UX), and accessibility are considered during the development process, less attention has been paid to how different user expertise might affect the visual interpretation of the data presented (5).