abstract

Enhancing Cancer Care: Strategies for Improved Patient Outcomes

Golam Zel Asmaul Husna, Anika Tahsin, Saiful Alam, Altaf Hossain, Tasneem Hossain, Jannatun Noor

AMSTRO

Asia and Middle East Society of
Therapeutic Radiation and Oncology

Affiliated with ASTF

abstract

Enhancing Cancer Care: Strategies for Improved Patient Outcomes

Author: Golam Zel Asmaul Husna[1], Anika Tahsin[2]
Saiful Alam[1], Altaf Hossain[1], Tasneem Hossain[1],
Jannatun Noor[3]

Affiliation: [1]National Institute of Cancer Research and Hospital
[2]Brac University Bangladesh
[3]United International University Bangladesh

Introduction: Cancer remains one of the leading causes of mortality in Bangladesh, where systemic limitations such as scarcity of oncologists, financial burden, and uneven distribution of specialized facilities hinder effective care. Patients often face long travel times, delays in diagnosis, and insufficient emergency responsiveness. Socio-cultural challenges, including low digital literacy, communication barriers, and reliance on family support, further complicate care continuity. This study presents a multidisciplinary approach, integrating Oncology, Human-Computer Interaction (HCI), and advanced computational techniques to design a mobile health (mHealth) platform for cancer patients, informed by qualitative insights from patients, caregivers, and oncologists.

Methodology: A qualitative research design was adopted, involving 32 participants (20 patients, 12 oncologists) from both public and private hospitals. Semi-structured interviews captured personal and professional perspectives on cancer care. Thematic analysis based on Braun & Clarke framework, identified key themes: financial hardship, delays in emergency response, diagnostic uncertainty, and communication gaps. These insights guided the design of a digital prototype emphasizing real-time connectivity, staging accuracy, and culturally sensitive accessibility. While computational tools such as real-time communication using WebRTC for peer-to-peer consultations, a TNM-based staging system connected to clinical databases via API integration, rule-based severity tagging for triage, and secure token-based authentication were implemented, the development was primarily informed by socio-cultural findings ensuring that the platform remained usable for low-literacy patients, adaptable to family-based caregiving structures, and relevant to the local healthcare context.

Results: Patients expressed overwhelming financial strain, dependence on family support, and difficulties in understanding medical explanations. Doctors

reported inefficiencies in retrieving patient histories, delayed report availability, and lack of structured triage. The prototype addressed these by:

1. enabling immediate virtual consultations to reduce travel burden,
2. introducing severity-based tagging for triage, and
3. offering structured reporting and reminders to improve adherence.

Preliminary evaluation demonstrated that patients welcomed digital support if the interface was simple, Bangla-enabled, and included voice assistance. Oncologists valued streamlined documentation and prioritized triage. Beyond computational performance tests, the system's impact was evaluated against socio-cultural expectations, showing improved patient trust, reduced waiting times, and enhanced continuity of care.

Conclusion: This study demonstrates that digital oncology solutions must be rooted in socio-cultural realities to achieve meaningful adoption. While computational modules such as real-time video communication and staging algorithms are essential, the greatest impact arises from aligning system design with patient experiences, caregiver practices, and cultural accessibility. By bridging technological innovation with user-centered insights, the proposed cancer care platform offers a feasible path to strengthen oncology care in resource-limited settings like Bangladesh.