Clinician perspectives around automating the Emergency Department triage process

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SUMMARY

Healthcare has arguably been the sector most impacted by the Covid-19 pandemic, leaving Emergency Department (ED) medical teams overworked and understaffed. An automated system for ED triage has been developed to help alleviate some of these pressures. Eight ED clinicians were interviewed to capture their views of the automated system. Insights were generated around where this system might add value and areas of challenge or concern. These findings will be used to refine the prototype for end-user testing and support the development of training material for clinicians.

KEYWORDS

Autonomous systems, healthcare, Emergency Department triage

Introduction

In July 2022 the Royal College of Emergency Medicine conducted a snapshot survey which showed that 94% of (87) Clinical Leads in UK Emergency Departments (ED) were not confident that their organisation would safely be able to manage forthcoming winter pressures ("RCEM snapshot survey", 2022). By October 2022, the British Medical Association reported that there were over 2.2 million ED attendances, with waiting times at record highs. The number of patients waiting over 12 hours from 'decision to admission' was 60 times higher than it was in October 2019 (impacting over 40,000 patients in October 2022) and believed to be an underestimate of actual waiting times ("NHS backlog data analysis", 2022). Healthcare has arguably been the sector most impacted by the Covid-19 pandemic, leaving ED medical teams overworked and understaffed. There is the potential for Artificial Intelligence (AI)-assisted diagnosis to alleviate some of these difficulties. The Diagnostic AI System for Robot-Assisted ED Triage (DAISY) project, funded by the Trustworthy Autonomous Systems Hub, is developing a robot system to automate the ED triage process. DAISY will enable a patient to input subjective information about their condition and will support the patient in capturing objective vital signs (e.g., blood pressure and temperature). DAISY will use its underpinning algorithms to perform an assessment with appropriate advisory information regarding a preliminary diagnosis and treatment plan, which the clinician will review and discuss with the patient. The aim of this study was to capture clinician perspectives around the introduction of this technology, to incorporate clinician requirements into future iterations of DAISY and to ensure communications and/or training content are aligned with concerns.

Method

An interview schedule, drawing on questions from the Schema Action World Research Method (Plant & Stanton, 2016; Parnell et al., 2022) and on the work describing social, legal, ethical,

empathetic, and cultural (SLEEC) norms and concerns in autonomous-agent contexts (Townsend et al., 2022) was developed to capture clinician perspectives for automating the ED triage process (i.e., the DAISY system). Participants were asked to describe the current (typical) process of ED triage, including clinical decision points. Questions centred around the role of past experiences and expectations, sources of information, cultural considerations, and empathetic practice. Subsequently, participants were introduced to the functionality of the DAISY system and questions covered areas including its potential utility, influences on trust, and the role of intuition and non-verbal cues (NVC) in patient-clinician interactions. Participants consisted of eight ED clinicians representing a range of roles including Nurse Practitioner (1), Junior Doctors (3) and Consultants (4). Clinicians worked at a variety of hospitals across England and the sample consisted of a 55% male to 45% female split, noting that all of the Consultants were male. Interviews were conducted on either MS Teams or Zoom and lasted ~45 minutes. The interviews were automatically transcribed using the MS Teams function and then 'cleaned' by one of the authors for sense checking. The data were thematically analysed using both inductive (generating insights from the data) and deductive (exploring data with SLEEC norms) approaches, the former will be discussed below.

Preliminary Results

The inductive analysis grouped the data into five core themes: insights into current practice, challenges/concerns, trust and ethics, added value/benefit, and future considerations. In relation to current practice, variability in the ED triage process between hospitals was apparent which would need to be considered in a wider rollout. All clinicians, regardless of job role, stated the importance of NVC and intuition when treating patients and the role of local knowledge (e.g., known drug offenders). Concern was expressed as to how these would be accounted for by the DAISY system. Patients seeking reassurance was stated at the primary outcome of patient-clinician interactions and the DAISY system was seen as potentially advantageous in this area by freeing up clinician time from routine tasks to spend with patients. Other added values included standardising the quality of triage reports and there were interesting insights into whether patients would be more likely to disclose sources of (sensitive) injury or domestic violence to a technological agent.

Conclusions and Future Work

Clinician insights have proved invaluable at understanding end-user perspectives, which will be used to refine the prototype system for pilot testing in a custom built testbed. A secondary outcome has been to demonstrate the importance of user-centred design to the non-Human Factors members of the team (i.e., software engineers). An interactive online survey (using videos of the working prototype) is in development to capture patient perspectives of the system.

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