Applying systems thinking to telephone triage

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SUMMARY

The NHS 111 telephone triage service is a complex sociotechnical system that likely carries specific safety risks not present in traditional face to face care. Despite apparent system safety risks, there is a paucity of research in telephone triage. This paper outlines the use of a macroergonomics approach to identify system components, their interactions and risks in telephone triage.

KEYWORDS

telephone triage, patient safety, systems thinking

Background

Telemedicine refers to the process of receiving medical advice or assessment via telephone call or video conferencing. Telemedicine use accelerated during the recent Covid-19 pandemic (Spaulding & Smith, 2021). Telephone triage – the assessment of patients' symptoms over the telephone and referral to an appropriate care setting – is an example of a telemedicine activity. To reduce cost and increase efficiency in health systems, many countries have set up dedicated telephone triage contact centres which provide access to urgent and primary care (Grol et al., 2006). As with all telemedicine systems, there are likely latent risks for patients accessing telephone triage services which are not present in traditional face to face care. Human factors methods such as systems thinking principles could hold the key to uncovering these risks (Nichols et al., 2004).

Telephone triage contact centre staff may be clinical or non-clinical. Many services use Computer Decision Support Systems (CDSS) to assist with triage, i.e. software which helps generate appropriate referral advice. In England, telephone triage is provided by NHS 111, which differs from other triage services globally, due to its use of mainly non-clinical staff operating a CDSS. Common to all telephone triage services is the lack of visual and haptic feedback available to professionals. Therefore, there is a heightened onus on patients to report their symptoms accurately and sometimes administer self-tests (Pettinari & Jessopp, 2001). The amalgamation of increased patient-professional collaboration and use of technology creates a complex socio-technical system.

The safety of telephone triage services has been disputed, with estimations of safety (percentage of calls not leading to harm) ranging from 46-97% (Huibers et al., 2011). Telephone triage services including NHS 111 have been implicated in patient harm and death (Rees et al., 2017). Situational awareness and organisational conditions have been alluded to in such cases, yet there is little research investigating the safety risks in telephone triage systems using a human factors approach. Working with a provider of NHS 111 (IC24), the current project aims to uncover latent safety risks in NHS 111 using systems thinking methodology, with the ultimate project aim to improve patient safety in the service.

Methods

Several contributory factors frameworks were evaluated for suitability for use in understanding system risks in telephone triage. The Systems Engineering Initiative for Patient Safety (SEIPS,

Carayon et al., 2006) was selected due to its flexibility across healthcare settings. Using SEIPS as a framework, a literature review was performed to identify previously outlined: measures of safety; system risks; system components and their interactions and; factors increasing the likelihood of adverse events. The second part of this project uses an adapted Macroergonomic Analysis and Design (MEAD) framework (Murphy et al., 2018) to understand NHS 111-specific system components, interactions and risks. Information gathered from stakeholder meetings, observations and document scanning was used to compose a system map which was validated by IC24's research and development (R&D) group. Interviews will be conducted using the critical incident technique to capture system risks from the perspective of contact centre workers. An exploratory thematic analysis will be performed using Leximancer software to understand the variances (risks) in the system and findings will be validated by the R&D group and employees at a second contact centre.

Results

The literature review confirmed a paucity of existing human factors research pertaining to telephone triage, particularly for non-clinical telephone triage staff. It also provided an understanding of telephone triage system components and their potential interactions, as well as measures of safety in telephone triage. By the time of the conference, it is expected that data collection for the MEAD study will be complete, meaning the system map and preliminary findings regarding system risks and contributory factors may be shared.

Limitations

NHS 111 is unique compared to other telephone triage services given its heightened reliance on non-clinicians to perform triage work. As a result, the generalisation of findings to clinical telephone triage settings may be limited, but interviews will be carried out with both clinicians and non-clinicians to capture risks at different system levels. IC24 is a social enterprise, so whilst risks may be similar, organisational pressures could differ in profit-driven 111 providers.

Practical and Theoretical Applications

This research attempts to address a gap in human factors literature pertaining to telephone triage, especially for non-clinical contact centre staff. The results will direct further studies into system risks and interventions in NHS 111. It validates systems thinking methodologies through the application of both the adapted MEAD method and SEIPS framework. Findings may be transferable to settings using non-clinical staff, such as general practice or emergency department receptionists.

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