Developing an evidence-based safety performance framework for telephone triage

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SUMMARY

This paper outlines a research project aiming to develop a framework to support telephone triage organisations (e.g., NHS 111) investigating safety incidents or planning system changes. The framework, developed using systematic review and Delphi methods, identified factors at multiple levels of triage work systems. Notable gaps meriting further research and consideration by system leaders included the effect of the physical environment on system performance.

KEYWORDS

Telemedicine, primary care, patient safety

Introduction

Telephone triage refers to the assessment of callers' symptoms and signposting to an appropriate healthcare service for their needs. For years, it has been a popular service worldwide and usage increased following the social distancing guidance imposed during the COVID-19 pandemic. The NHS 111 – the telephone triage service available in England and Wales – receives on average, over one million calls per month (NHS, 2024). Though popular and widespread in use, telephone triage as a healthcare activity has received relatively little attention in research literature (Poots et al., 2024). Moreover, telephone triage imposes unique challenges for patient safety compared to face-to-face care, since callers are not physically co-present, placing a heightened onus on callers to accurately report their symptoms and – of particular relevance to NHS 111 – call handlers are not always clinically trained (Morgan & Muskett, 2020). Since many existing frameworks for learning from incidents are designed with secondary (hospital) care in mind, this can be problematic for learning from incidents. The aim of this research was to identify factors from earlier studies that influence patient safety in telephone triage and assess their generalisability to the NHS 111 system in England and Wales through expert consensus.

Methods

First, a systematic literature review and best-fit framework synthesis was undertaken to identify a) how safety has been measured previously in primary care telephone triage organisations and b) potential factors contributing to telephone triage safety. Following an initial bibliometric analysis of the same databases (Poots et al., 2024), PubMed and Scopus were searched for studies evaluating safety in primary care telephone triage organisations globally, yielding 4121 papers. These were screened for eligibility by two researchers (see Poots et al., 2022 for the full protocol), resulting in the inclusion of 96 studies. Using the Systems Engineering Initiative for Patient Safety (SEIPS) 2.0 model (Holden et al., 2013) as the "best-fit" framework, data from the studies were extracted in alignment with the SEIPS components.

To ascertain the generalisability of the review findings and identify additional factors, a modified Delphi study was conducted. An expert panel comprising 23 professionals from academia and healthcare (mostly from Integrated Urgent Care) was recruited through opportunity and snowball sampling. The experts stated their agreement with 138 factors identified from the review presented via online survey (consensus was defined as 70% agreement or disagreement) and offered additional factors not accounted for. This process continued until consensus was reached on all of the items (three rounds in total). Twenty-one experts participated in Round 2, and 16 in Round 3. To enhance framework usability, the agreed factors were arranged thematically using reflexive thematic analysis (Braun & Clarke, 2019). The framework was presented to the panel for feedback on its usefulness and practicality.

Results

Most evaluative research on telephone triage safety has been conducted primarily in USA, UK, and Australia. Safety was most often measured by authors as the appropriateness of the service offered to telephone triage patients. Most research studies focused on individual person factors (either the patient or triage professional; $n = 86$), followed by tools and technology factors ($n = 35$ papers). There were very few identified research papers ($n = 6$) which considered the effect of the physical environment on safety.

Generally, there was high agreement with the factors synthesised, and many suggestions. For example, in the first round of the modified Delphi study, 115 items were agreed for inclusion, and an additional 66 were suggested by the panel. Two more rounds followed, and the final list of factors totalled 186 after including and agreeing or disagreeing on new suggestions. To improve usability of the framework, these were arranged into themes such as, 'technology design can affect safety', 'technology use can affect safety'. These were organised into a visual format which will be presented at the conference. Feedback was positive regarding the representativeness of the framework, with suggestions for accessibility of the framework design.

Discussion

With telemedicine and e-health use increasing, human factors can provide a useful lens through which to investigate these systems and understand how their design can affect system outcomes. The framework developed here highlights 186 unique, evidence-based factors in telephone triage, validated with experts, which could support the investigation of safety incidents and stimulate thought when planning for system changes. Further application and refinement are required to improve the usefulness of the framework in local systems.

The systematic review revealed a significant knowledge gap concerning the impact of the physical call centre environment on telephone triage performance, which differs markedly from hospital and clinical settings. Additionally, few studies examined interactions between different levels of the system, indicating a need for more holistic research approaches. While the review showed that most research has been conducted in Westernized countries, it is important to acknowledge a limitation of this study: only English-language studies were included. Furthermore, as most experts consulted were familiar with telephone triage systems in England and Wales, the framework's applicability in other countries has yet to be tested.

In conclusion, this study provides a robust framework to support telephone triage organizations, such as NHS 111, in improving patient safety through enhanced organizational learning (e.g. incident investigation) and more effective planning for system changes (e.g., procurement processes).

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