Optimizing Handover Information Transmission in Long-Term Care Facilities Using Natural Language Processing

Lun-Ping Hung

National Taipei University of Nursing and Health Sciences, Taipei, Taiwan

Syu-Bo Jhang

National Taiwan University of Science and Technology, Taipei, Taiwan

Ming-Hung Chen

National Taipei University of Nursing and Health Sciences, Taipei, Taiwan

Ya-Han Zhang

National Taipei University of Nursing and Health Sciences, Taipei, Taiwan

Abstract

In care facilities, handovers are a critical process for transmitting service and care information between caregivers, ensuring continuity and safety in elderly care. Handover records are typically stored in handwritten or electronic form and often contain freehand, narrative-style descriptions. These records may include information about symptoms and physical conditions, behaviors and emotions, as well as daily needs and care measures. However, because the content is unstructured and highly variable in expression, it can be inconsistent, with key information hidden within lengthy narratives. This forces subsequent caregivers to spend additional time reading and interpreting the text to make informed decisions, thereby increasing the risk of information omissions, misunderstandings, or delays in care.

With the increasing workload and staff turnover in long-term and day care facilities, there is a growing need for efficient tools to identify and summarize critical care points quickly. To address this, the present study applies natural language processing (NLP) techniques to conduct keyword analysis on handover records. Specifically, three deep learning models—T5, BERT, and roberta-base—are used to extract and highlight essential care information. The models' performance is compared to evaluate their effectiveness in rapidly identifying key terms related to elderly care needs. Among them, T5 has the best performance, achieving an F1-Score of 0.9905. This approach aims to enhance the accuracy and efficiency of information transmission during handovers, contributing to improved care quality and decision support in care facilities.

Keywords

Handover records, elderly care, keyword extraction, natural language processing, deep learning models.