Application Fields and Innovative Technologies

From Comprehensive Geriatric Assessments at Home to Care Plans: Development and Digitization of Customizable Forms W. Haque, S. Freeman, H. Fournier, G. Reimer. *Gerontechnology* 25(s*)*

Purpose Providing patient-centred homecare requires thorough analysis of assessments and patient data over time. These indirect activities take time from nurses and homecare workers that could be spent directly interacting with patients. A study of 300 nurses found that 35.7% of their working time was spent on indirect activities [1]. The purpose of this project is to optimize the workflow of homecare services by integrating a web-based virtual patient-management platform that incorporates patient data and vitals collection, conducting assessments at home, allocation of resources, data analysis, and AI-assisted care plan generation – all on a single integrated platform. Digitizing these tasks relieves healthcare workers of repetitive work, allowing homecare workers to devote more time to direct patient care. Additionally, a digital home care solution opens the possibility of exploring technological integrations, such as sensor data and the use of large language models, to offer insights into patient care and assist in generating evidence-based, comprehensive care plans. **Method** An interactive mobile solution integrated with a web platform allows caregivers to conduct comprehensive geriatric assessments at home, and view medical history, vitals, documents, and profiles of their assigned patients. An access control module ensures that patient information is only accessible to authorized users. Reports are generated to display how patients' assessments, care needs, and medical data changed over time, allowing staff to manage evolving conditions and the need for future assessments. Staff-related reports offer insight into resource allocation through metrics and outcomes. The platform focuses on improving the efficiency and quality of homecare processes through features such as dynamic comments, image uploading, and a mobile app for in-person assessment-taking. While standard forms such as ADL, IADL, and GDS-15 are built into the baseline portal, a key feature of our implementation is the ability to create customized forms using an interactive interface. The questions included in these forms can range from binary types to dropdowns, freeform, matrix, and numerical formats. Questions can be re-ordered, include instructions, and grouped under categories for an intuitive design experience. The frontend of the application was developed using Angular, whereas the backend uses a .Net Core API hosted in the cloud using Amazon Web Services. The serverless architecture chosen for this project focuses on affordability and security. **Results and Discussion** Compiling all patient information and documentation into one interface aims to greatly reduce the time healthcare workers spend retrieving and updating data. Sample patient data has been digitized within the application and represents accurate and reliable data collection. The users can complete and update profiles, assessments and other information whenever it becomes available. Our design also removes redundant data collection, for instance, when more than one patient needs to be assessed at the same location. The application has been handed over to a homecare facility for use and data collection in an actual homecare/caregiver environment. This work is progressing towards achieving two other milestones. First, we plan to auto-generate care plans based on the assessments using Machine Learning models. The emergence of powerful large language models, especially OpenAI's ChatGPT LLM [2], show promising applications for generating LLM-based virtual patients for the digitized assessment forms. Second, data from sensors will be integrated into this entire process – from assessments to care plans.

References
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