

Defining the Concept of a Smart Nursing Home and its Potential Technology Utilities that Integrate Medical Services and are Acceptable to Stakeholders: A Scoping Review

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ABSTRACT

Smart technology in nursing home settings has the potential to elevate an operation that manages a larger number of elderly residents through efficient services and safer 24-hour functional care. However, the concepts, definitions, and scopes of ‘smartness’ integrated medical services, and stakeholders’ acceptability of smart nursing homes are less clear. This scoping review aimed to define a smart nursing home and to examine the extent (size), range (variety), and nature (characteristics) of evidence on technological feasibility and integration of medical services in a smart nursing home and acceptability of it by older people and their caregivers. In this study, comprehensive searches were conducted on stakeholders’ websites and eleven (11) electronic databases for existing definitions, concepts, and criteria of a smart nursing home (Phase 1), and on what and how technologies and medical services were implemented in nursing home settings, as well as acceptability assessment by the stakeholders (Phase 2). The publication year was limited to and inclusive of January 1999 to June 2020. Included articles must report nursing home settings and related to older people ≥ 60 years old with or without medical demands. The Framework Method was used to summarize and reduce texture data by applying thematic analysis in both inductive and deductive approaches. We synthesized and provided a definition of a smart nursing home, and evaluated the feasibility of technologies by adopting a Technology Readiness Level assessment to measure the new technology developments. The analysis was guided by a theoretical model proposed by Golant (2017) and reported according to the PRISMA-ScR. The findings reveal that a total of one hundred and fifty-nine (159) literature were included and data retrieved. A clear concept of smart nursing homes was defined. As a collective or individual aged care model, the smart nursing homes were supported by physical devices that are connected to the internet, Internet of Things (IoT), digital health, information management system (IMS), big data, and artificial intelligence (AI), computing technologies and cloud computing to provide integrated and personalized nursing care. The feasible technologies related to ‘smartness’ in nursing home settings were mainly implemented on monitoring of abnormal events, remote clinical services, clinical information management, big data analysis, and device developments for activities of daily living assistance. Electronic clinical information, telemedicine, and mHealth (mobile self-care smartphones or tablet apps enabling consumers to monitor their own health data) were more likely to be integrated with other forms of medical services in the nursing care delivery to support the complex nursing and medical cares that would be convenient, comfortable and safe to their residents. The technology appraisal process was determined by the perceived efficaciousness, perceived usability and perceived collateral damages of adopting smart technology. The attributes of direct users such as their sociodemographic factors and the severity of elderly residents’ illnesses were associated with stakeholders’ acceptability. This was

also influenced by the persuasiveness of external and internal information of the smart solutions. It is therefore concluded that smart nursing homes with integrated medical services have great potential to improve the quality of care. With a clear concept of smart nursing homes, the stakeholders and policymakers will be able to effectively develop the smart nursing home models that embed with appropriate technologies, integrate relevant medical services to benefit the ageing societies.

Keywords: Smart technology, integration of medical services, healthcare, quality of care, stakeholders' acceptability