Presentation: Fall events in long-term care

V.K. MAGO, R. WOOLRYCH, A. SIXSMITH. ***Understanding fall events in long-term care using a fuzzy cognitive map.*** *Gerontechnology 2012;11(2):343;* doi:10.4017/gt.2012.11.02.769.00 **Purpose** Falls are the number one cause of unintentional injury among older adults in Canada, causing over 90% of hip fractures and wrist fractures, and 60% of head injuries[1]. Most studies have focused on establishing risk factors for falls amongst those older adults living in the community[2]. However, it is important to identify the causes of falls and the circumstances surrounding these adverse events in order to formulate effective fall prevention strategies[3]. The main purpose of this research is to develop a comprehensive model of falls in long-term care (LTC) facilities that will incorporate the multiplicity of factors contributing to a fall incident. The fuzzy cognitive map (FCM) is a first step in developing a computer simulation that can be used to target interventions to reduce the incidence of falls in LTC. **Method** A complex system approach[4] allows the fall to be investigated as a process, rather than interpreted as an isolated incident. This approach incorporates a broad range of data sources from the perspectives of the faller, the formal caregiver, and other stakeholders. The systems approach forms the basis of our proposed modelling technique which utilizes fuzzy logic and cognitive mapping to produce a FCM. FCM-models support the modeling of complex problems due to their inherent ability to capture and model factors and their relationships using linguistic terms. These terms are easily interpretable by domain experts, allowing scientists to construct virtual worlds in which the complex, interdependent factors of a problem scenario can be captured and their interactions or causal relationships modelled for easy interpretation[5]. To construct FCMs, the research work examines the fall event from an ecological model perspective[6] which specifies four types (micro-, meso-, exo-, and macro-) of nested environmental systems, with bi-directional influences within and between the systems. Finally, the modelling process designs a mechanism to weave different FCMs together to make one comprehensive FCM. **Results & Discussion** The proposed complex systems modelling using FCM and ecological system theory allows the development of working models that capture the complex nature of falls within LTC, without compromising the semantic integrity of the phenomena for the sake of operational simplicity. It also provides an opportunity to incorporate potential factors that have only a weak empirical basis. The FCM will be used as the basis for developing a computer simulation, which will then be validated using empirical data from case studies of fall events in LTC-facilities. The simulation model will allow the users (policy makers, researchers, and care providers) to test various potential interventions to reduce the incidence falls in LTC-facilities.

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Keywords: information technology, modelling, falls, complex system, fuzzy cognitive map
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Full paper: No