

Innovative Assistive Technologies in Dementia Care between Hopes and Disillusion. A Critical Reflection Based on the Tech@home Experience in Sweden

Chair: Carlos Chiatti, Sweden

Session Type: Symposia

Global dementia rates will more than triple by 2050, thus challenging society. Due to ageing in place policies, informal caregiving is increasing as more people with dementia continue living at home despite significant care needs. While most caregivers are willing to act as such, they are not always adequately supported, thus reporting a high burden, worse mental and physical health. Innovative Assistive Technologies (IAT) have been proposed as a means to support them. While much research has been funded in this area and companies are developing and promoting such solutions, little empirical research has been conducted to evaluate the effectiveness of implementing new IAT from a broader societal view. This symposium presents findings from the Tech@Home study in Sweden, but adopts a broader perspective for reflecting upon the general challenges of implementing new IAT in the homes of people with dementia.

The first presentation will focus on what is known from the literature presenting the results of a systematic review looking at acceptance and adherence to IAT in dementia. The second presentation addresses the qualitative results of a study of the experiences of people with dementia and their informal caregivers participating in an IAT-based home intervention. As sensors in the home have the potential to generate large amounts of data, the third presentation focusses on methodological implications related to using such (big) data. We will use temperature sensors as an example to explore strategies to link sensor data to health status and draw meaningful predictions of health outcomes. The fourth presentation will present findings from Tech@Home in terms of clinical outcomes. In conclusion, thanks to two external discussants, the symposium will discuss most relevant challenges of conducting research with IAT solutions in the homes of people with dementia, and on how both internal and external validity of research findings could be ensured in this respect.

Acceptance and Adherence to Innovative Assistive Technologies among People with Cognitive Impairments and their Caregivers

Björg Thordardottir [Oslo,Norway]¹, Agneta Malmgren Fänge [Sweden]², Connie Lethin [Sweden]², Danae Rodriguez Gatta [Sweden]², Carlos Chiatti [Sweden]²

Oslomet- Oslo Metropolitan University¹, Lund University²

Objectives: Cognitive Impairments (CI), associated with the consequences of Alzheimer 's disease and other Dementias, are increasingly prevalent among older adults, leading to deterioration in self-care, mobility and interpersonal relationships among them. Innovative Assistive Technologies (IAT) such as electronic reminders and surveillance systems are considered as increasingly important tools to facilitate independence among this population and their caregivers. The aim of this study is to synthesise knowledge on facilitators and barriers related to acceptance of and adherence to IAT use among people with CI and their caregivers.

Material and methods: Systematic review including original papers with quantitative, qualitative or mixed methods design. Relevant peer-reviewed articles published in English between 2007 and 2017 were retrieved in the following databases: CINAHL; PubMed; Inspec; and PsycINFO. The Mixed Method Appraisal Tool (MMAT) was used for quality assessment.

Results: We retrieved thirty studies, including in total 1655 participants from Europe, USA/Canada, Australia and Asia, enrolled in their homes, care-residences, day-centres or Living Lab. Two-third of the studies tested technologies integrating home sensors and wearable devices for care and monitoring CI symptoms. Main facilitators for acceptance and adherence to IAT were familiarity with and motivation to use technologies, immediate perception of effectiveness (e.g., increase in safety perceptions) and low technical demands. Barriers identified included: older age, low maturity of the IAT, little experience with technologies in general, lack of personalization and support. More than 2/3 of the studies met 80% of the quality criteria of the MMAT.

Conclusion: Low adherence to the use of IAT, both independently and with caregivers remains a significant concern. More knowledge on facilitators and barriers to use of IAT among clients of health care and social services is crucial for the successful implementation of innovative programmes aiming to leverage innovative.

Innovative Assistive Technology in Dementia Home Care: Findings from the Tech@Home study

Agneta Malmgren Fänge [Sweden]¹, Susanna Spinsante [Italy]², Connie Lethin [Sweden]¹, Gunilla Carlsson [Sweden]¹, Carlos Chiatti [Lund, Sweden]¹

Lund University¹, Università Politecnica delle Marche²

BACKGROUND: Dementia is a staggering disease putting people and their informal caregivers at risk of serious physical, psychological and social problems. The aim of Tech@Home is to evaluate the effects of Innovative Assistive Technologies on caregiver burden among informal caregivers of people with dementia by reducing the need for supervision.

METHODS/DESIGN: Tech@Home is a Randomized Controlled Trial aimed to recruit dyads composed of people with dementia living in community settings and their primary informal caregivers. Participants with dementia in the intervention group received a home monitoring kit installed in their home, including home-leaving sensors, smoke and water leak sensors, bed sensors, and automatic lights. Kits were able to send alerts via text message and/or phone call to the caregiver if anything unusual occurred. All study dyads received three home visits, at enrolment and 3 and 12 months following installation of the kit. The primary outcome of the study was the amount of informal care support provided by primary informal caregivers to people with dementia. Parallel with the experiment, a qualitative study was conducted, targeting the challenges and experiences among the project staff. Applying a modified Delphi methodology, in a first step an electronic survey was distributed to the professionals (n=11) and a focus group (n=6) to investigate methodological and practical issues arising during the implementation of the study.

RESULTS AND DISCUSSION: The study closure is expected for April 2019. 112 participants have been enrolled in the study. The presentation will present the results of the efficacy analysis of the technological intervention in terms of clinical outcomes, but will also explore the determinants of technology successful and unsuccessful implementation. Likewise, factors that might be affecting the internal and external validity of the study will be presented in order to inform future studies in the field.

Home Sensor Data: Optimizing Methods to Assess Impact of Indoor Home Temperature on Health

Steven Schmidt [Sweden]¹, Yukie Nakajima [Japan]², Toshiharu Ikaga [Japan]², Carlos Chiatti [Sweden]¹

Lund University¹, Keio University²

Cold temperature is a well-known risk factor for mortality particularly among older adults and cold indoor temperature reduces physical functioning putting older adults at risk for frailty with prolonged exposure. Such evidence increases the importance of strategies to maintain adequate indoor home temperatures, especially in terms of social justice, as fixed incomes after retirement place older adults with lower financial resources at increased risk for fuel poverty and colder homes. New “smart home” technologies are marketed to give people remote access and control over the home environment (including temperature). Similarly, smart technologies are being tested as a means to improve care for people with chronic health conditions and to reduce caregiver burden. This coincidence provides an opportunity to learn about the relationship between the environment and health. This presentation discusses the results of a secondary analysis from the Tech@home study assessing the relation between clinical outcomes and home temperature in a sample of people with dementia. In this study, different sensors (including indoor temperature) were installed in 90 homes. Data on temperature and humidity were collected every 30 minutes for 12 months. Health assessments were conducted at baseline, 3, and 12 months. Although data were collected near continuously, the timing of health assessments did not always correspond to the periods with the coldest indoor temperature, so it was difficult to find significant relationships. However, average seasonal indoor temperatures were easier to link, chronologically, to the health assessments. This study demonstrates that secondary analyses with sensor data can be difficult. Hence planning at the start of a study for how sensor data could be best utilized is essential. Strategies are needed to assess the relationship between indoor home temperature and health outcomes to better influence policies aimed to reduce fuel poverty.

People with Dementia and Informal Caregivers' Experiences of Using Innovative Assistive Technologies at Home

Connie Lethin [Sweden]¹, Gunilla Carlsson [Sweden]¹, Carlos Chiatti [Sweden]¹, Agneta Malmgren Fänge [Sweden]¹

Lund University¹

Background: The majority of people with dementia (PwD) prefer to live independently in their own home. Innovative assistive technologies (IAT) may provide a solution. The last decade, much effort has been invested in the development of new technologies to support aging in place, such as sensor-based (smart) networks. However, many challenges remain, including the effective involvement of the target end-users group of the technologies themselves, the consideration of their experiences, perceived benefits and expectations.

Aims: The aim of this study was to explore experiences of using IAT in ordinary housing among PwDs and informal caregivers (IC), their expectations on the system, its perceived advantages and disadvantages.

Methods: This study is part of the TECH@HOME project (2016- 2019), aiming to evaluate the effect of technologies on independence among PwD and regarding IC burden and stress. This study was a qualitative study with semi-structured interviews of PwD (n=9) and IC (n=21). The participants were interviewed between six and twelve months after using the technologies in their homes. The interviews were conducted between June and September 2018, transcribed verbatim and analysed using grounded theory method.

Results: Preliminary results showed that the PwD were not always aware of full features of the installed technology. When they were, they expressed the *technology as a precaution that made life easier*. IC expressed that to them the *technology is a safety measure that only should exist and not disturb*. The technology should be *well proven and with reliable support*. The IC raised *surveillance as ethical dilemmas* regarding to have or not have ICT in the house.

Conclusion: This study provides a deeper insight into how PwDs and IC experience, advantages and disadvantages from using technologies at home as well as their expectations. This knowledge is essential to develop suitable and effective home solutions for PwD and their IC which might serve as precaution and safety intervention to enable independence in their own home promoting aging in place.