

SYMPOSIUM

General Symposium

N. BIER, P. BELCHIOR (Convenors). An integrative approach to understand the use of technology to support functional autonomy in cognitively impaired older adults. Gerontechnology 2018;17(Suppl):11s; <https://doi.org/10.4017/gt.2018.17.s.011.00>

Participants M. COUTOURE (CAN), P. BELCHIOR (CAN), N. BIER (CAN), and M. LUSSIER(CAN). **Issue** This symposium will address the perspectives of multiple stakeholders related to the use of technology as tools for clinicians working in home care services with older adults with cognitive deficits. **Content** Over 70% of adults aged 75 and over have disabilities that limit their daily activities. Despite these disabilities, they want to stay at home as long as possible. In a context of scarcity of human and financial resources, gerontechnology appears to be an essential tool in promoting aging at home and supporting social and health care systems. However, few technologies are developed and implemented by taking into consideration all the stakeholders, from users to individuals who implement the technology (i.e., from older individuals to health care systems). This symposium aims to raise issues related to this situation by presenting: (1) the perspectives of older adults, their families, clinicians, and administrators regarding the usefulness and clinical integration of technology; and (2) how new technology may support the work of social and health care providers when used with an innovative approach. **Structure** Melanie Coutoure will first present the perspective of stakeholders regarding the implementation of technology in the context of home care services for older adults at risk of self-neglected including divergent expectations. She will also discuss barriers and facilitators to the implantation of technology in this context. Patricia Belchior presents on current clinical practices concerning the use of gerontechnology by Canadian occupational therapist working with the geriatric population including, clinician familiarity with technology, types of technology used in practice and barriers and facilitators of technology use. Nathalie Bier will present clinicians perspectives about using a tool to support meal preparation in older adults with cognitive deficits and how this tool could be adapted to the particularities of this population. Maxime Lussier will present the potential of using smart homes to analyze performance on daily living tasks in order to support clinicians in the early diagnosis of Alzheimer's disease. **Conclusion** The projects and perspectives presented during this symposium are expected to highlight the significant contribution of including different stakeholders from design to the implementation of technology. We will draw from different perspectives to share the knowledge gained by using an integrative approach. Future steps to our work will also be presented.

Keywords: technology, implementation, social and health care system, functional autonomy, perspectives, dementia, mild cognitive impairment

Address: Université de Montréal, Centre de recherche de l'Institut universitaire de gériatrie de Montréal, Montréal, Canada;

E: nathalie.bier@umontreal.ca

SYMPOSIUM

General Symposium

M. COUTURE, S. BANDALY, S. GIROUX, M. LUSSIER, C. BOTTARI, H. PIGOT, G. PARÉ, K. BOUCHARD, S. GABOURY, N. BIER. *Expectations of stakeholders regarding technology in home care to optimise the functional autonomy of clients. Gerontechnology 2018;17(Suppl):12s*; <https://doi.org/10.4017/gt.2018.17.s.012.00>

Purpose In Quebec, administrators of home care are more and more open to offering smart environments as part of services to maintain at home individuals facing an important loss of autonomy. Nonetheless, the implementation of technology in the context of home care requires the involvement of other stakeholders including care providers, clients and their families. The influence of care providers on the implementation of technology within the healthcare system is documented (Cf. Reviews¹⁻²). However, little information is available about the implementation of technology in the community as well as the perspective of the clients and their families. Consequently, stakeholders in home care may not have the same expectations as those working in an institutional setting. Acceptance of technology is not the only barrier to the implementation³, other factors such as social, technical, and organizational context can play a role².

Method Prior to implementing technology within home care services of an Integrated University Health and Social Services Centre in Montreal (Quebec), the purpose of this qualitative study was to evaluate the perspectives of multiple stakeholders in regards to: (1) facilitators and barriers to maintaining individuals at risk of self-neglect at home; and (2) expectations toward technology to optimise the functional autonomy of this clientele. Individuals and group interviews were conducted with administrators (n = 2), head of services (n=5), care providers (n = 8), as well as clients at risk of self-neglect (n = 5) and their caregivers (n = 3). Data was analyzed using the approach of Miles, Huberman and Saldana⁴.

Results & Discussion Perspectives of stakeholders were sometimes complementary but also divergent. On the one hand, the concept of perceived risk for the client was central to the decision-making process regarding the type of support needed to maintain the person at home including technology. On the other hand, some of the clients expressed relatively no needs for services as they perceived themselves as functioning well at home while other stakeholders identified important problems. Overall, technology was expected to fulfill two main functions: (1) obtaining additional data to support the decision-making process related to the type and frequency of support needed to maintain the client at home; and (2) supporting the autonomy of the client. In conclusion, these results suggest that the implementation of technology within home care requires merging perspectives from multiple stakeholders to have a common understanding of the needs of the client and identify common objectives regarding the role of technology.

References

1. Abbott PA, Foster J, de Fatima Marin H, Dykes PC. Complexity and the science of implementation in health IT- Knowledge gaps and future visions. *International Journal of Medical Informatics*. 2014;83(7):e12-e22
2. Cresswell K, Sheikh A. Organizational issues in the implementation and adoption of health information technology innovations: An interpretative review. *International Journal of Medical Informatics*. 2013;82(5):e73-e86
3. Vest JR. More than just a question of technology: Factors related to hospitals' adoption and implementation of health information exchange. *International Journal of Medical Informatics*. 2010;79(12):797-806
4. Miles MB, Huberman AM, Saldana J. *Qualitative Data Analysis*. Sage. 2014

Keywords: technology, implementation, social and health care system, functional autonomy, perspectives

Address: Centre for Research and Expertise in Social Gerontology, Cote Saint-Luc, Quebec, Canada;

E: melanie.couture.cvd@ssss.gouv.qc.ca

SYMPOSIUM

General Symposium

P. BELCHIOR, C. MENARD, A. ABOUJAOUDE, M. LUSSIER, M. COUTOURE, L. DEMERS, C. AUGER, H. PIGOT, M. CAOUILLE, D. LUSSIER-DESROCHERS, N. BIER. *Barriers and facilitators of Gerontechnology use by occupational therapists in Canada working with seniors. Gerontechnology 2018;17(Suppl):13s; <https://doi.org/10.4017/gt.2018.17.s.013.00>*

Purpose Occupational therapists (OT's), as rehabilitation health care professionals are experts in adapting home environments as such, they play an important role with regards to the use of gerontechnology in the health care system. Concomitantly, gerontechnology may support OT's practice in formulating plans to maintain independent living in older adults. However, to our knowledge, no study has investigated the current state of Canadian clinicians' knowledge of gerontechnology or, whether they are using this type of technology. We also don't understand the potential barriers and facilitators encountered by clinicians in adopting gerontechnology in their clinical practices. A better understanding of the factors which influence their use of gerontechnology could assist in formulating recommendations to promote its integration in clinical practices and, ultimately, in improving home care services for seniors. The overall goal of this study was to identify OT practices relative to the use of gerontechnology. We aimed to answer the following questions: (1) What is clinicians' familiarity with gerontechnology; (2) What are the most common types of gerontechnology used by OT's; and (3) What are the barriers and facilitators encountered by OT's in using gerontechnology.

Method A Canadian-wide survey was developed to investigate Canadian OT's practices relative to gerontechnology. An online questionnaire was sent directly to OT's via their provincial licensing body or association. Questionnaire completion took about 5-10 minutes and was available in English and French. The main sections of the questionnaire included questions about: (1) Clinicians familiarity with gerontechnology; (2) The main types of gerontechnology used by OT's; and (3) Barriers and facilitators encountered by OT's in using gerontechnology in their clinical practices.

Results & Discussion Three hundred and eighty-seven clinicians working with a geriatric population completed the survey; 46% reported being familiar with gerontechnology; among those, 13% are familiar and use it and 33% are familiar but do not use it. The remaining 54% were not familiar or were not sure about their familiarity. Technologies to support cognition and technologies to support communication were the main types of technologies used by clinicians. Among the clinicians that are familiar and use technology, ease of operations was the most common facilitator but among clinicians that are familiar but do not use technology the usefulness of technology was the most common facilitators. Concerning the barriers to technology use, among clinicians that are familiar and use technology the lack of training was the most cited and among clinicians that are familiar but do not use technology the lack of availability of technology was the most common barrier. In conclusion, almost half of the clinicians surveyed reported being familiar with gerontechnology but few of them actually uses it in their clinical practices. Lack of training and lack of availability of technology seems to be the most common factors that limit its utilization in practice. In this presentation, we will discuss general strategies to improve the use of gerontechnology and also propose recommendations to promote its integration in clinical practices related to home care services for seniors.

Keywords: gerontechnology, clinical practices, aging

Address: McGill University: 3654 Drummond, Montreal, QC, Canada, H3G 1Y5/ Centre de recherche de l'Institut universitaire de gériatrie de Montréal;

E: patricia.belchior@mcgill.ca

SYMPOSIUM

General Symposium

N. BIER, M. GAGNON-ROY, M. COUTURE, C. BOTTARI, S. GIROUX, P. BELCHIOR, M. LUSSIER, H. PIGOT. *COOK: A cognitive orthosis to support meal preparation in elderly with cognitive deficits. Gerontechnology 2018;17(Suppl):14s*; <https://doi.org/10.4017/gt.2018.17.s.014.00>

Purpose Maintaining the ability to prepare meals independently in Alzheimer's disease (AD) is of paramount importance to the individuals themselves and to their caregivers¹. However, numerous difficulties in completing tasks and inherent safety concerns, such as burns and fire hazards, make this a high-risk activity for individuals with cognitive deficits. To date, technologies to support cooking in AD have nearly exclusively focused on limiting or prohibiting engagement in meal preparation^{2,3}, such as the use of a timer that cuts the stove's power off. Efficient technological solutions to support meal preparation should thus be developed. Our team recently developed a cooking assistant, named COOK. This innovative application for smart tablets, linked to a context-aware environment, includes two systems: a cognitive assistance system, using evidence-based practice in cognitive rehabilitation, and a security system designed to prevent or manage potential critical errors. Using this technology, crucial errors such as leaving the stove unattended for too long while something is cooking on high is detected and the security system ensures the person's safety by turning off the stove and calling for help. However, to be appropriate for persons with AD, COOK must be adapted to the specific needs of this clientele and its efficacy tested in large-scale studies. The main objective of this pilot study was to understand the clinicians and caregivers' perspectives about: (1) the main difficulties encountered during meal preparation in the dementia continuum, i.e. including mild cognitive impairments (MCI) and AD; (2) the type of assistance that facilitates greater independence and promotes safety; and (3) the relevance of using COOK in the dementia continuum.

Method The pilot study followed the first step of a participatory-research design, using focus groups. Focus groups were conducted with occupational therapists (OTs) working in different clinical settings and with experience in aging (n = 24). Data was analyzed using the approach of Miles, Huberman and Saldana⁴.

Results & Discussion (1) The main difficulties identified by the OTs in both populations were memory, planning, and adaptation to new elements. Impairments such as greater memory deficits, limited or no learning ability and difficulties in initiating the task differentiated early dementia patients from those with MCI; (2) Differences in assistance needs were identified: compensation and use of automatism were necessary with dementia, while problem-solving approaches may be possible with MCI; and (3) According to OTs, use of COOK with older adults with MCI may help support safety and greater independence during meal preparation, especially for those with computer skills. However, doubts have been identified regarding the use of COOK in dementia care. Time and place of learning have also been discussed, as well as how to integrate this assistive technology in the public health care system. In conclusion, COOK may be an interesting tool to support older adults with cognitive deficits during meal preparation, especially those with MCI. It should, however, be adapted to the specific needs of this population, by taking into account the difficulties identified by OTs, which mainly involved executive functions and memory related deficits.

References

1. Wherton JP, Monk AF (2008) Technological opportunities for supporting people with dementia who are living at home. *Int. J. Hum. Comput. Stud.* 66, 571–586
2. Orpwood R, Gibbs C, Adlam T, Faulkner R, Meegahawatte D (2005) The design of smart homes for people with dementia—user-interface aspects. *Univers. Access Inf. Soc.* 4, 156–164
3. Jensen L, Månsson I, Holthe T, Hurnasti T, Guðnadóttir Þ (2009) How assistive technology support cognitive disability, secure active living for persons with dementia and enhance new interfaces between formal and informal care in the area of dementia. In *Assistive Technology from Adapted Equipment to Inclusive Environments: AAATE 2009* IOS Press, pp. 1–12
4. Miles MB, Huberman AM, Saldana J. *Qualitative Data Analysis*. Sage Publication. 2014

Keywords: technology, implementation, social and health care system, functional autonomy, perspectives, dementia, mild cognitive impairment

Address: Université de Montréal, Centre de recherche de l'Institut universitaire de gériatrie de Montréal, Montréal, Canada;

E: nathalie.bier@umontreal.ca

SYMPOSIUM

General Symposium

M. LUSSIER, S. GIROUX, B. CHIKHAOUI, M. GAGNON, S. ADAM, C. CONSEL, B. GILBERT, M. GUAY, C. HUDON, H. IMBEAULT, F. LANGLOIS, D. LORRAIN, J. MACOIR, I. ROULEAU, L. TALBOT, N. BIER. *Memory, executive functions, and naturalistic assessment of activities of daily living in mild cognitive impairment using smart home sensors. Gerontechnology 2018;17(Suppl):15s; <https://doi.org/10.4017/gt.2018.17.s.015.00>* **Purpose** Timely diagnostic of Mild Cognitive Impairment (MCI) is essential as interventions that reduce symptoms and promote home support are more effective when set up early¹. A plethora of recent studies suggest that performance on instrumental activities of everyday life (IADL), such as preparing a meal, are affected in MCI^{1,2}. Moreover, difficulties performing on IADL may predict conversion from healthy cognition to MCI² and from MCI to dementia³. However, common assessment tools for IADLs are not very sensitive⁴. A newer approach to questionnaires consists in measuring the behaviors of participants while they perform ADL and IADL in a smart environment^{5,6}. The objective of this study was to analyse performance on IADLs in a smart environment and to explore its relationship with MCI and cognitive performance. **Method** All participants were 65 years old of age or older. No-MCI participants had to score $\geq 26/30$ on the Montreal Cognitive Assessment. Participants with MCI were recruited via the memory clinics. After a cognitive evaluation, all participants were instructed to carry out five daily activities (based on the Task of the Six Elements), in any order, within 45 minutes. The five tasks were performed in a smart apartment equipped with twelve z-wave sensors connected to a server collecting human motion, door contact and electric appliance usage. **Results & Discussion** Twenty-six (26) no-MCI participants and 22 MCI participants were recruited. Based on sensor analyses, the MCI group spent significantly more time in the kitchen than the no-MCI group. Among all appliances and storage monitored, the MCI group also spent more time looking in the fridge and in the kitchen cabinets. Moreover, these behaviors recorded with the sensor significantly predicted executive function and memory in participants. In conclusion, smart environment could help predict MCI and cognitive performances in older adults, especially thorough cooking related behaviors. Standardized and automated evaluations could be performed in safe environments without an observer on site. Such technology could contribute to the functional evaluation of an occupational therapist.

References

1. Rodakowski J, Saghabi E, Butters MA, Skidmore ER. Non-pharmacological interventions for adults with mild cognitive impairment and early stage dementia: An updated scoping review. *Molecular aspects of medicine*. 2015;43:38-53
2. Chen Y, Denny KG, Harvey D, Farias ST, Mungas D, DeCarli C, Beckett L. Progression from normal cognition to mild cognitive impairment in a diverse clinic-based and community-based elderly cohort. *Alzheimer's & dementia*. 2017;13(4):399-405
3. Devanand DP, Liu X, Brown PJ. Impact of functional deficits in instrumental activities of daily living in mild cognitive impairment: a clinical algorithm to predict progression to dementia. *Alzheimer Disease & Associated Disorders*. 2017;31(1):55-61
4. Bottari C, Dassa C, Rainville C, Dutil E. The criterion-related validity of the IADL Profile with measures of executive functions, indices of trauma severity and sociodemographic characteristics. *Brain Inj*, 2009;23(4):322-335
5. Cook DJ, Schmitter-Edgecombe M, Dawadi P. Analyzing activity behavior and movement in a naturalistic environment using smart home techniques. *IEEE journal of biomedical and health informatics*. 2015;19(6):1882-1892
6. Jekel K, Damian M, Wattmo C, Hausner L, Bullock R, Connelly PJ, Graessel E. Mild cognitive impairment and deficits in instrumental activities of daily living: a systematic review. *Alzheimer's research & therapy*. 2015;7(1):17

Keywords: gerontechnology, activities of daily living, smart home, mild cognitive impairment, functional autonomy, cognition

Address: Centre de recherche de l'Institut universitaire de gériatrie de Montréal, Montréal, Quebec, Canada, H3W 1W6;

E: lussier.maxime@gmail.com