

CENTRE for HEALTH SERVICES RESEARCH

Final Report: Activity 20

Telehealth enabled systems to improve medicines use among persons with cognitive impairment and dementia in residential aged care facilities.

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PARTNERSHIP CENTRE: DEALING WITH COGNITIVE AND RELATED FUNCTIONAL DECLINE IN OLDER PEOPLE

FINAL REPORT

Activity Number: 1320

Title of Project: Telehealth enabled systems to improve medicines use among persons with cognitive impairment and dementia in residential aged care facilities.

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End Date of project: 31 December 2018

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EXECUTIVE SUMMARY

There is substantial evidence that medicines use among people with dementia who are living in aged care facilities is not ideal. However, ideal prescribing requires a difficult balance between under- and over-prescribing. Those responsible for prescribing, dispensing and administering medicines can be assisted through prescribing guides; and through reviews conducted by specialists, namely geriatricians and pharmacists. Ideally, these systems and specialists' input should be synchronised to ensure the best results. However, because visits by specialists are infrequent and expensive, reviews do not occur consistently, nor do they occur simultaneously among general practitioners, geriatricians and pharmacists.

Telemedicine provides opportunities to overcome these difficulties. We proposed an online system to enable specialists to review and recommend changes to medicines without visiting a facility, including an ability for pharmacists and geriatricians to share opinions online. To enable this study, twenty vignettes of aged care residents were prepared and independently reviewed by five pharmacists and five geriatricians using a telehealth platform (Res-e-Care) to record their recommendations for medications. The main outcomes examined were the level of agreement between pharmacists and geriatricians on medication recommendations, changes in the mean number of medications after pharmacists' and geriatricians' reviews, and pharmacists' and geriatricians' feedback of the telehealth process for medication reviews.

Both pharmacists and geriatricians had fair agreement about their recommendations for medications and both groups recommended significant reductions in the number of medications prescribed for residents. Geriatricians found having the pharmacists' reports available added value to their comprehensive geriatric assessment consultations and pharmacists saw the potential of online reviews being used as a part of routine practice to improve accessibility of the service.

By enabling sharing information and discussion among health professionals caring for a patient, the proposed telehealth platform can potentially help to develop a consensus approach for making more precise therapeutic decisions for patients. Compared to onsite Resident Medication Management Reviews (RMMRs), this study has shown that, for pharmacists, online reviews can be less time consuming, as well as reducing travel time. It is also possible that telehealth can improve the timeliness of reports, and eliminate the need for 'batching', that is delaying visits to the aged care facilities until sufficient cases have been accumulated.

While the telehealth platform tested here is not proposed as a substitute for the current conventional model of conducting RMMRs or the proposal to have onsite pharmacist in residential aged care facilities, it is an alternative way of delivering the service to overcome the issues of accessibility and timeliness. It has the additional potential benefits of enabling synchronous collaboration among health professionals, minimising duplication of effort and optimising prescribing for the vulnerable population in long term care. Ideally, the online system would increase the access to specialists, i.e. pharmacists and geriatricians, for the long term care residents who currently have poor access to these services.

BACKGROUND

A significant and increasing number of Australians over the age of 70 are residents of long-term aged-care facilities. Of these residents, over 50% have dementia [1]. There is substantial evidence that medicines use among people with dementia who are living in aged care facilities is not ideal [2]. Multiple comorbidities make it difficult to follow clinical guidelines, many of which may not be appropriate for this population given their frailty and limited life expectancy [3]. Delivering health care that meets the complex needs of this population poses multiple challenges, in particular medication management [4].

Medication management strategies include reviews conducted by pharmacists, through Residential Medication Management Reviews (RMMRs) or by specialists, namely Geriatricians, undertaking Comprehensive Geriatric Assessments. Ideally, these systems and specialists' input should be synchronised to ensure the best results. However, because visits by specialists are infrequent and expensive, reviews do not occur consistently, nor do they occur simultaneously among General Practitioners (GPs), Geriatricians and Pharmacists. This is particularly a problem for the residents living in regional or remote areas, which constitute about 30% of Australian aged care residents [5]. These issues can be overcome with the use of alternative methods of healthcare delivery, such as telehealth, which has been proposed as a solution to the issues of accessibility and timeliness of medical services [6]. Telehealth also provides a platform for collaboration of different healthcare professionals caring for a patient [6]. A collaborative approach to medication review services may produce the best results in optimising prescribing of long term care residents, especially those with dementia who may be at higher risk of adverse drug events [7].

A project was undertaken to explore existing telehealth capabilities to deliver medication review strategies to persons living in RACFs, seeking to optimise effectiveness and efficiency.

AIM

To test the potential value and acceptability of a telehealth system to deliver coordinated medication review services to residents of aged care facilities, through collaboration of pharmacists and geriatricians.

Objectives

1. Contribute to the improved quality of care in use of medications among persons with dementia who live in residential aged care facilities (RACF). It will achieve this through a variety of telehealth strategies, which are designed to overcome the challenges of distance, diseconomies of scale, and coordination of input of key health professionals.
2. Provide better evidence for service providers and decision makers on the use of technology in delivering integrated multidisciplinary medication review and the impact of this on prescribing.

Research Questions

- a) What is the level of agreement on medication recommendations between pharmacists and geriatricians?
- b) What is the added value of a collaborative approach to Residential Medication management Reviews?
- c) What are potential efficiencies to the system comparing pharmacists' usual practice (travel time, time taken to complete the RMMR, and time taken for the completed report to be available) with online RMMRs
- d) What is the acceptability of online RMMRs from pharmacists' perspectives.

METHODS

The protocol to address the research questions has been published [8]. In brief, five RMMR accredited pharmacists were recruited. To test the Res-e-Care telehealth platform (resecare.com.au), 20 de-identified cases previously referred for geriatric consultation were prepared. After suitable training to navigate the telehealth system and access the resident's clinical profile online, including medications, the pharmacists conducted medication reviews on these 'virtual' cases, as they would have done in routine practice. They were asked to make a recommendation for each medication: 1- no change; 2- stop; 3- increase dose; 4- decrease dose; or 5- decrease dose with view to stop. They also recorded any new medications they were recommending for each case. Time taken to complete the review was recorded. Lastly, their opinions on their experience with the telehealth modality were sought in a questionnaire.

Subsequently, five geriatricians were recruited to perform comprehensive geriatric assessment (CGA) on the same 20 cases, record their recommendations for each medication using the same format and record any new medication they were recommending. After completing each assessment, they were provided with a pharmacist's medication review report, with each geriatrician seeing the same pharmacist's report for that case. Geriatricians were then asked to re-consider recommendations on medications and report whether they confirmed or changed their original decisions. In addition, for each case, geriatricians were asked whether they found the pharmacist's report helpful and if yes, did it help to confirm and/or change their decisions.

Ethics approval to conduct the study was obtained from the University of Queensland Human Research Ethics Committee (Clearance Number: 2016-SOMILRE-0182).

Data collected and analysis undertaken

Outcome measures included:

- The level of agreement among any two pharmacists and among any two geriatricians determined by using a dichotomised outcome (change/ no change) for each medication
- Changes in the mean number of medications from baseline after reviews by pharmacists and by geriatricians and also after geriatricians viewed a pharmacist's report and re-considered their recommendations
- Number of changes in geriatricians' original decisions on medications after viewing a pharmacist's report
- Geriatricians' feedback on 'value-added' of having pharmacists' reviews available
- Pharmacist feedback on telehealth platform for comparison with usual practice including time taken to complete reviews using online versus face-to-face RMMRs

Quantitative data were analysed using descriptive statistics. The level of agreement on medication recommendations was assessed using Cohen's Kappa statistics and reported according to Landis and Koch interpretations (poor (< 0.00), slight (0.00-0.20), fair (0.21-0.40), moderate (0.41-0.60), substantial (0.61-0.80), and almost perfect (0.81-1.00)) [20]. Stata, version 15.0 (StataCorp., College Station, TX) was used for this analysis. Paired t-tests were used to compare baseline mean number of medications with the mean number of medications after pharmacists' and geriatricians' reviews, and also to compare mean number of medications recommended by geriatricians before and after viewing a pharmacist's report. This analysis was performed using the Statistical Package for Social Science 25.0 (IBM Corp., Armonk, NY). A significance level was set at $p \leq 0.05$.

RESULTS

The findings have been submitted for publication and are under review.

In summary, in the 20 cases prepared for online reviews, the residents were prescribed an average of 14.9 medications (ranging from 5 to 25 medications). A total of 297 medications were reviewed, generating 1485 recommendations (5 × 297 medications) per group. ‘No change’ was the most frequent recommendation among both pharmacists and geriatricians comprising 79.7% and 73.9% of recommendations respectively. Recommendations to stop or decrease dose with a view to stop the medication were also common among both groups and included 15.5% of pharmacists’ and 21.1% of geriatricians’ recommendations. Pharmacists recommended a new medication should be added to a patient’s medication regimen on 87 occasions, of which 38 (43.7%) were to replace a medication the resident was using. For geriatricians, the number of times they recommended a new medication was 63, of which 30 (47.6%) were to replace an existing medication. “Fair” agreement was seen between any two of the pharmacists for their recommendations for medications (agreement 78.1%; kappa 0.30). The result was similar for geriatricians with any two having fair agreement (agreement 73.6%; kappa 0.31).

Review by pharmacists significantly reduced the mean number of medications over 20 cases from 14.9 to 13.4 ($p < 0.001$). Review by geriatricians also significantly reduced this number from 14.9 to 12.3 ($p < 0.001$). The reduction made by geriatricians was significantly more than the reductions made by pharmacists ($p = 0.005$). Geriatricians reduced the number of medications even further after viewing pharmacists’ reports (12.3 to 12.2), however, this reduction was not significant.

Of 1485 recommendations on medications, there were 1040 (70%) occasions of agreement between geriatricians and pharmacists (Figure 1). Of the 430 occasions of disagreement, geriatricians changed their decisions on medications on 51 occasions, after viewing pharmacists’ reports.

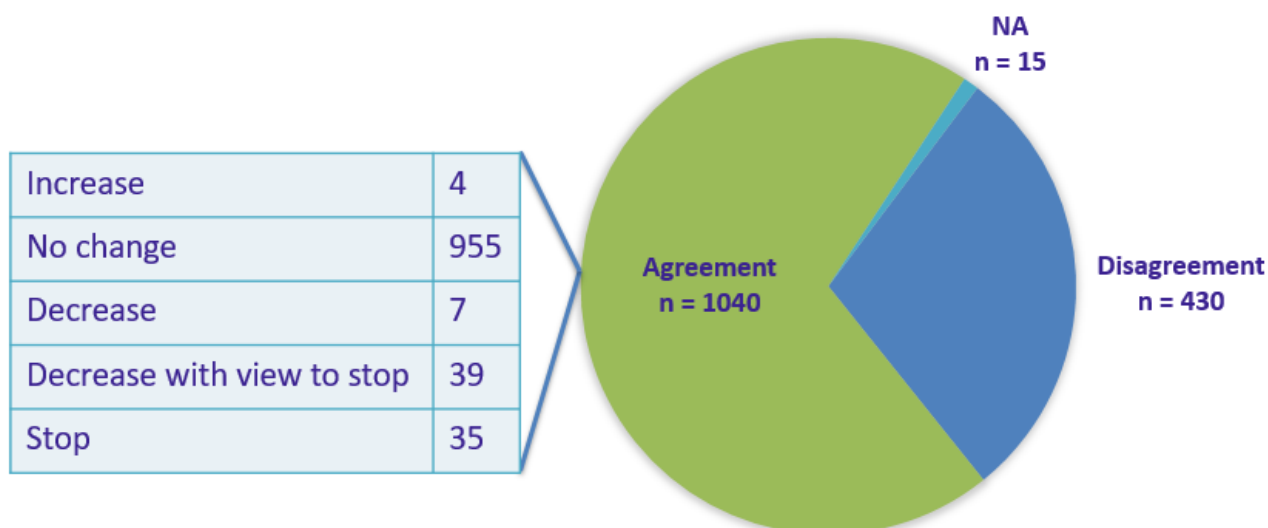


Figure 1: Agreement between pharmacists’ and geriatricians’ recommendations for medications

Geriatricians indicated that they found the pharmacist report helpful in 72.0% of the reviews. This was through helping them to confirm and/or prompt them to change at least one of their original decisions in 68.0% and 45.0% of the reviews, respectively.

Over the visits to 24 facilities, the five pharmacists completed a total of 243 reviews, at an average of 10 reviews per visit (range 3 to 26). Median return travel time to these 24 facilities was 65 minutes (range 20 minutes to 25 hours 30 minutes), travelling a median of 61 kilometres (range 10 to 1774 kilometres). In only one of the 24 visits, the report writing was completed onsite. On most occasions (17/24), the reports were

made available to the facility more than 48 hours after the visit. In 8 out of 24 visits, pharmacists reported an issue or barrier affecting their capacity to conduct RMMRs during that visit. Those issues included nurses not being available to discuss the case, computer and login issues, being new to the facility, and doctors' rounds which limited access to residents' files. Each onsite RMMR took a median of 55 minutes (interquartile range (IQR) 45-71 minutes). In comparison, the 100 online medication reviews completed by pharmacists (5 pharmacists x 20 cases) took a median of 42 minutes (IQR 30-60 minutes) per review. Both these median times included the time spent writing of the reports.

Pharmacists reported the advantages of the online system to be the convenience of having all the information in one place, including the availability of a complete functional profile of the resident, without the need to travel. The main disadvantage they reported was not being able to discuss with staff or observe the resident, as well as finding the clinical information inadequate in a minority of cases. The challenges pharmacists reported were mainly of a technical nature. For example, they expressed issues around the navigation of the telehealth portal and finding the required information. To overcome these, they stated experience, spending extra time on the portal, and adjusting to the system to be helpful. The majority of pharmacists (4/5) reported they would be prepared to use the system as part of their routine practice.

DISCUSSION

Pharmacists and geriatricians share expertise in medication management. Studies of their involvement in medication management interventions have shown improvement in clinical and medication-related outcomes across different settings [9]. The measured agreements among both groups of healthcare professionals in this research show that discrepancies in opinions can be present in both inter- and intra-disciplines. By enabling sharing information and discussion among health professionals caring for a patient, the proposed telehealth platform can potentially help to develop a consensus approach for making more precise therapeutic decisions for patients. Medication reviews that involve collaboration between healthcare professionals have been shown to optimise prescribing [10]. In our study, geriatricians found the availability of a pharmacist review helpful in the majority of occasions, which was mainly through helping them to confirm their own decisions

Compared to onsite RMMRs, this study has shown that, for pharmacists, online RMMR reviews can be less time consuming, as well as reducing travel time. It is also possible that telehealth can improve the timeliness of reports, and eliminate the need for 'batching', that is delaying visits to the aged care facilities until sufficient cases have been accumulated.

CONCLUSIONS AND IMPLEMENTATION RECOMMENDATIONS

While the telehealth platform tested here is not proposed as a substitute for the current conventional model of conducting RMMRs or the proposal to have onsite pharmacist in residential aged care facilities, it is an alternative way of delivering the service to overcome the issues of accessibility and timeliness. It has the additional potential benefits of enabling synchronous collaboration among health professionals, minimising duplication of effort and optimising prescribing for the vulnerable population in long term care. Ideally, the online system would increase the access to specialists, i.e. pharmacists and geriatricians, for the long term care residents who currently have poor access to these services.

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8. Freeman CR, Peel NM, Watts JN, Gae-Atefi TA, Caffery LJ, Hubbard RE, et al. Development of a protocol for telehealth Residential Medication Management Reviews to enable collaboration of pharmacists and geriatricians. *Journal of Pharmacy Practice and Research*. 2017;47(2):153-7.
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10. Shafiee Hanjani L, Long D, Peel NM, Peeters G, Freeman CR, Hubbard RE. Interventions to Optimise Prescribing in Older People with Dementia: A Systematic Review. *Drugs Aging*. 2019;36(3):247-67.

DISSEMINATION

Publications arising from this research

Freeman CR, Peel NM, Watts JN, Gae-Atefi TA, Caffery LJ, Hubbard RE, et al. Development of a protocol for telehealth Residential Medication Management Reviews to enable collaboration of pharmacists and geriatricians. *Journal of Pharmacy Practice and Research*. 2017;47(2):153-7.

Shafiee Hanjani L, Long D, Peel NM, Peeters G, Freeman CR, Hubbard RE. Interventions to Optimise Prescribing in Older People with Dementia: A Systematic Review. *Drugs & Aging*. 2019;36(3):247-267.

Shafiee Hanjani L, Peel NM, Freeman CR, Gray LC. Using telehealth to enable collaboration of pharmacists and geriatricians in residential medication management reviews. *International Journal of Clinical Pharmacy* 2019 (under review).

Shafiee Hanjani L, Caffery L, Freeman CR, Peeters G, Peel NM. A scoping review of the use and impact of telehealth medication reviews *Research in Social and Administrative Pharmacy* 2019 (under review).

Presentations

Centre for Health Services Research Geriatric Medicine Seminar Series 2019, Brisbane.
Leonard Gray, Nancye Peel, Leila Shafiee Hanjani.

Using telehealth to enable collaboration of pharmacists and geriatricians in residential medication management reviews.

Australian & New Zealand Society for Geriatric Medicine Annual Scientific Meeting 2018, Sydney.
Leila Shafiee Hanjani, Nancye Peel, Christopher Freeman, Liam Caffery, Mark Chatfield, Ruth Hubbard, Leonard Gray.

Telehealth residential care medication reviews to enable collaboration of pharmacists and geriatricians

Cognitive Decline Partnership Centre Annual Conference 2018, Canberra.

Nancye Peel.

Using telehealth to enable collaboration of pharmacists and geriatricians in residential medication management reviews.

Successes and Failures in Telehealth International Conference 2018, Darwin.

Leila Shafiee Hanjani, Nancye Peel, Christopher Freeman, Liam Caffery, Len Gray.

A study on telehealth pharmacist-led residential medication management reviews.

Australasian Pharmaceutical Science Association Annual Conference 2018, Adelaide.

Leila Shafiee Hanjani, Duncan Long, Nancye Peel, Geeske Peeters, Christopher Freeman, Ruth Hubbard.

Interventions to optimize prescribing in older people with dementia: a systematic review.

The University of Queensland Faculty of Medicine Clinical and Public Health Symposium 2018, Brisbane.

Leila Shafiee Hanjani, Duncan Long, Nancye Peel, Geeske Peeters, Christopher Freeman, Ruth Hubbard.

Interventions to optimise prescribing in older people with dementia: a systematic review.

Princess Alexandra Hospital Health Symposium 2017, Brisbane.

Leila Shafiee Hanjani, Nancye Peel, Christopher Freeman, Liam Caffery, Ruth Hubbard, Len Gray.

Telehealth Medication Reviews to Enable Collaboration of Pharmacists and Geriatricians.

Successes and Failures in Telehealth International Conference 2017, Brisbane.

Leila Shafiee Hanjani, Liam Caffery, Christopher Freeman, Nancye Peel, Len Gray.

Telehealth medication reviews: what is the evidence?

Australasian Pharmaceutical Science Association and Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists Joint Scientific Meeting 2017, Brisbane.

Leila Shafiee Hanjani, Christopher R. Freeman, Nancye M. Peel, Liam J. Caffery, Leonard C. Gray.

A study on usual Residential Medication Management Review (RMMR) practice.

The 4th Australian Deprescribing Network Scientific Meeting 2017, Brisbane.

Leila Shafiee Hanjani, Liam Caffery, Christopher Freeman, Nancye Peel, Leonard Gray.

A scoping review on telehealth-enabled medication reviews.

Cognitive Decline Partnership Centre Technology and Telehealth Workshop 2016, Sydney.

Chair: Leonard Gray.

Telegeriatrics.

FUTURE RESEARCH

The PhD candidate embedded in project -Leila Shafiee Hanjani (PharmD, MClinPharm) - was successful in being awarded an ERA (Emerging Researchers in Ageing) Travel Exchange Program 2018 for a domestic exchange at the University of Sydney under supervision of Professor Sarah Hilmer. This will enable her to continue the CDPC collaborative work with Professor Hilmer to examine medication changes made after Resident Medication Management Reviews.

The following studies form part of a thesis dissertation by Leila Shafiee Hanjani, whose PhD research was supported by the CDPC. Her doctoral thesis is due for submission in early 2020.

1. Prescribing practice among people with dementia in RACFs, exploring relationships of medicines with cognitive and physical function and geriatric syndromes.

Res-e-Care (<https://resecare.com.au/>) is a service created to implement Geriatrician led comprehensive geriatrics assessment (CGA) into residential aged care facilities (RACFs). Geriatricians are partnered with individual RACFs, and “attend” weekly by video-conference to consult new residents and existing residents with diagnostic or management issues. The CGA approach that it supports in RACFs, is based on the interRAI Long Term Care Facilities (LTCF) assessment system.

This study is a secondary analysis of de-identified data from permanent residents in residential aged care facilities across Queensland, referred through Res-e-Care for specialist geriatric consultation. From May 2006 to October 2017, data from 720 residents, across 17 residential care facilities were collected using the interRAI Long Term Care for comprehensive geriatric assessment. All medications are coded according to the World Health Organisation (WHO) Anatomical Therapeutic Chemical (ATC) Classification System. Cognitive status is measured by the Cognitive Performance Scale.

The aim of this study is to compare the patterns of medication prescribing for Australian aged care residents based on their cognitive status. Specifically, to compare:

- i. The number of medications and the exposure to polypharmacy
- ii. The use of different medication categories and classes
- iii. The use of PIMs according to the 2015 Beers criteria
- iv. Exposure to anticholinergic and sedative medications measured by the Drug Burden Index (DBI)
- v. The use of preventive medications.

2. A randomised controlled trial of a geriatrician led medication review to assess medication appropriateness and impact on outcomes.

The Res-e-Care service model was evaluated in a cluster Randomised Controlled Trial (RCT) involving 5 intervention and 5 control RACFs in Brisbane, with 3 and 6 months follow-up. A formal medication review was a component of the CGA process. The primary hypothesis was that the model will result in a decline in transfers out of the facility (to Emergency Departments (EDs), hospital and ambulatory clinics). Secondary analysis of the data is being undertaken to assess intervention effects on medication appropriateness and impact on outcomes.

FINANCIAL SUPPORT

This work was supported by the National Health and Medical Research Council (NHMRC) Partnership Centre for Dealing with Cognitive and Related Functional Decline in Older People (Grant no. GNT9100000).