

Supplementary Table S1. Overview of the methods and 4-month outcomes of the SIMPLER cluster randomized controlled trial [1, 3, 6-9].

| Methods | Overview |
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| Study aim | To investigate the application of a structured process to consolidate the number of medication administration times for individuals accessing residential aged care services |
| Participants | <p>242 permanent, English-speaking residents (intervention n=99, comparison arm n=143) with a median age of 87 years (IQR 81-92) were recruited from eight RACFs located in South Australia between April and October 2017. At study entry, the median Charlson Comorbidity Index score was 2 (IQR 2-3), the median Katz Index of Independence in Activities of Daily Living score was 1 (IQR 1-3) and the median Frailty in Nursing Homes (FRAIL-NH) score was 7 (IQR 3-10). At study entry, participants were charted medications for regular administration an average of four times daily.</p> <p>Delivery of the intervention involved an experienced clinical pharmacist visiting the RACF to apply the Medication Regimen Simplification Guide for Residential Aged Care (MRS GRACE) tool to identify opportunities to simplify medication regimen for the participating residents. The pharmacist identified opportunities to simplify the medication regimen for a participating resident and communicated these recommendations to senior RNs and the resident's GP.</p> <p>MRS GRACE is an implicit tool designed to guide the process of medication simplification in RACFs. The tool, which was validated by two pharmacists, encourages the user to work through the following five key questions when determining whether a medication regimen can be simplified:</p> <ol style="list-style-type: none"> 1. Is there a resident related factor that precludes simplification? 2. Is there a regulatory or safety imperative that precludes simplification? 3. Is simplification likely to result in any clinically significant drug-drug, drug-food, or drug-time interactions? 4. Is there no alternative formulation available that can support less complex dosing? 5. Is simplification likely to result in any unintended consequences for the resident or facility? |
| Intervention group | Further information about the development and validation of MRS GRACE, and the accompanying explanatory statement, is available from the following open access publication: [9] |
| Comparison arm | Residents who participated in the study from the 4 comparison RACFs received usual care. |
| Outcome measures | <ul style="list-style-type: none"> • The primary outcome was the number of medication administration times per day for medications charted regularly at 4-month follow-up. • Secondary outcomes were resident satisfaction and quality of life. • Harms were falls, medication incidents, hospitalizations, mortality. • Medication simplification was possible for 62 (65%) of the 96 residents who received the intervention. Recommendations often focused on changing the time of medication administration (65%). Just over half (58%) of all simplification recommendations could potentially be implemented by a senior RN at the RACF. |
| Main findings | <ul style="list-style-type: none"> • At 4-month follow-up, 57 (62%) of the 92 medication simplification recommendations had been implemented. Among the 62 residents for whom simplification was possible, at least one simplification recommendation was implemented at 4-month follow-up in 46 (74%) residents. • The mean number of medication administration times at 4-month follow-up was reduced in the intervention arm in comparison to usual care (-0.36, 95% CI -0.63 to -0.09, p=0.01). • No difference in resident satisfaction or quality of life at 4-month follow-up between the study arms was observed. • No significant differences in harms were observed between the study arms at 4-month follow-up. |
| <p>CI confidence interval, GP general medical practitioner, IQR interquartile range, MRS GRACE Medication Regimen Simplification Guide for Residential Aged Care, RACFs residential aged care facilities, RCT randomized controlled trial, RN registered nurse, SD standard deviation, SIMPLER Simplification of Medications Prescribed to Long-term care Residents.</p> | |

Supplementary Table S2. Summary of research questions, methods, and data sources for the process evaluation, adapted from Grant et al. [11].

| Domain | Research question | Research methods and/or data sources ^a |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recruitment of RACFs | How were the RACFs sampled and recruited? | <ul style="list-style-type: none"> • Document analysis of recruitment logs. • Semi-structured interviews with the aged care provider staff and research team. |
| | Who agrees to participate? | |
| | Why do the RACFs agree to participate (or not)? | |
| Recruitment and reach among residents | Who receives the intervention in each setting? | <ul style="list-style-type: none"> • Document analysis of clinical pharmacist logs and intervention reports prepared by the pharmacist. • Semi structured interviews with all stakeholders. • Quantitative analysis of baseline data collected for the SIMPLER study, data provided by the aged care organization and publicly available data. |
| | Are they representative? | |
| | What factors impacted on resident recruitment? | |
| Delivery to RACFs | What intervention is delivered for each RACF? | <ul style="list-style-type: none"> • Document analysis of clinical pharmacist logs and intervention reports (quantitative and qualitative). • Semi-structured interviews with clinical pharmacist and aged care provider staff. |
| | Is it the one intended by the researchers? | |
| Delivery to individual residents | What intervention is delivered to the resident? | <ul style="list-style-type: none"> • Document analysis of clinical pharmacist logs and intervention reports (quantitative and qualitative). • Semi structured interviews with all stakeholders. |
| | Is the delivered intervention the one intended by the researchers? | |
| Response of RACFs | How is the intervention adopted and supported by individual RACFs? | <ul style="list-style-type: none"> • Document analysis of research team records (quantitative and qualitative). • Semi-structured interviews with all stakeholders. |
| Response of residents and other individuals | How does the target population respond? | <ul style="list-style-type: none"> • Document analysis of clinical pharmacist's logs. • Semi-structured interviews with all stakeholders. |
| Future implementation | What is the feasibility, facilitators, and barriers to wider implementation of the intervention? | <ul style="list-style-type: none"> • Semi-structured interviews with all stakeholders. |
| Unintended consequences | Are there any unintended changes in processes and outcomes, both related to the trial intervention and unrelated care? | <ul style="list-style-type: none"> • Document analysis of records maintained by the research team and the clinical pharmacist. • Semi-structured interviews with all stakeholders. • Principles of the theoretical framework underpinning Australia's National Strategy for Quality Use of Medicines [23] and existing medication management activities in Australian RACFs [16] were considered in the design of the intervention and when interpreting process evaluation findings. |
| Theory | What theory has been used to develop the intervention? | <p>The SIMPLER study setting and context are outlined in the introduction and methods section, and in Supplementary Table 1.</p> |
| Context | What is the wider context in which the trial is being conducted? | |

^a Data were utilized in the qualitative analysis unless stated otherwise. RACF residential aged care facility, SIMPLER SIMplification of Medications Prescribed to Long-tErm care Residents.