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An Initial Feasibility Evaluation of a Targeted, Pharmacist-Led Intervention for Older Adults Experiencing Polypharmacy: A Mixed-Methods Approach

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ABSTRACT

The use of multiple medications concurrently is linked to the prescribing of potentially unsuitable drugs and preventable adverse effects related to medicines. An innovative intervention directed by pharmacists seeks to detect and address unsuitable prescribing in elderly individuals experiencing polypharmacy. To perform an initial evaluation of the intervention's practicality in a primary care environment, examining whether particular elements of the intervention's protocols and operations could be implemented as planned. This study, employing both quantitative and qualitative approaches, obtained ethical clearance from the New Zealand Health and Disability Ethics Committees as well as the relevant public health authority. Over a four-week period, individuals attending a general practice in New Zealand were enrolled to undergo the intervention. The initial practicality review encompassed aspects such as delivery of the intervention, outcomes reported by participants, and feedback from ten participants and six healthcare providers. Analysis involved statistical examination and thematic interpretation of data to assess the justification for a larger-scale trial of the intervention. Progression benchmarks for the research, derived from established guidelines, informed the decision process. The intervention satisfied the predefined progression benchmarks, covering aspects like enrollment of participants, ongoing participation, and compliance with procedural steps. Nonetheless, certain improvements were noted, namely: (1) improving strategies for enrolling participants, (2) introducing an initial consultation between the participant and pharmacist, (3) aiding pharmacists in adopting a participant-focused perspective, (4) reassessing the selected outcome measure reported by participants, (5) prolonging the follow-up duration beyond eight weeks, (6) providing additional time allocation for pharmacists to deliver the intervention. The research determined that implementing the intervention is practical; nevertheless, further refinement is necessary prior to advancing to a comprehensive trial. This approach shows promise in mitigating harm associated with medicines and enhancing health results for elderly patients affected by polypharmacy.

Keywords: Aged, Feasibility studies, Geriatrics, Inappropriate prescribing, Pharmacists, Polypharmacy

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Introduction

The simultaneous use of several medicines, known as polypharmacy, presents significant difficulties for health systems globally. Factors contributing to polypharmacy include population aging, expanded use of preventative therapies, and rising rates of multiple health conditions [1-3].

Conventionally, polypharmacy has been categorized using numerical cutoffs, with definitions varying from at least two medicines up to eleven or more as documented in various studies [4]. It is crucial to recognize, however, that a higher number of prescriptions is not always detrimental. For example, research by Payne *et al*. indicated comparable risks of unscheduled hospital visits between patients with multiple conditions using four to six drugs and those using one to three (odds ratio 1.00; 95% confidence interval 0.88–1.14) [5].

Appropriate polypharmacy occurs when prescribing aligns with evidence for individuals with multiple conditions [1]. A case in point is the advantageous use of combined therapies following a minor stroke or major ischemic

event [6]. In contrast, polypharmacy turns problematic with the inclusion of potentially unsuitable medicines (PIMs), where risks exceed advantages, treatments lack ongoing justification, or negative interactions and reactions arise [1, 7].

Elderly individuals face heightened risks from problematic polypharmacy owing to greater accumulation of multiple conditions [1], alongside physiological changes associated with aging that increase susceptibility to adverse effects from drugs [8]. Moreover, such polypharmacy may elevate the overall burden of treatment, affecting daily living and social engagement [9].

Tools based on explicit standards have been employed to detect and quantify problematic polypharmacy. These standards compile lists of PIMs based on evidence and expert agreement. Notable examples include the international Beers Criteria [10], the STOPP/START tools [11], and localized versions like the New Zealand Criteria, which highlight PIM signals recommended by local experts for thorough evaluation [12].

Additionally, technological solutions have emerged for addressing problematic polypharmacy. In 2023, Liu *et al*. presented PolyScan, a system designed to assist providers in spotting elderly patients with polypharmacy and PIMs needing attention. PolyScan exhibited excellent accuracy, with perfect sensitivity, specificity, and predictive values in screening for cases warranting deeper assessment [13].

Although explicit standards and PolyScan aid in detecting and assessing problematic polypharmacy, they fall short in personalizing treatment according to individual patient traits and priorities. The investigators here highlighted the requirement for a tailored intervention addressing problematic polypharmacy in elderly patients, incorporating personal treatment goals. To address this, a new intervention led by pharmacists was created for community-based care, aiming to enhance medicine utilization and minimize PIMs in elderly patients with problematic polypharmacy. This approach integrates the PolyScan system with pharmacist-conducted educational sessions and reviews of prescriptions.

Aim

The objective of this research was to evaluate the initial practicality of delivering the intervention in a community clinic setting. Key procedural and operational aspects were examined, alongside gathering opinions from participants and providers, to determine the viability of a larger clinical trial.

Ethics approval

The research complied with the principles outlined in the Declaration of Helsinki and was granted approval by the New Zealand Health and Disability Ethics Committees (reference number: 20/STH/238 date: 12/01/2021) and Te Whatu Ora Te Pae Hauora o Ruahine o Tararua, the regional public health organization (reference number: 2021.01.021 date: 20/04/2021).

Materials and Methods

This study, utilizing combined quantitative and qualitative techniques, followed guidance from the Medical Research Council framework for creating and assessing complex interventions [14].

The PolyScan information technology tool

PolyScan incorporates 21 indicators of potentially inappropriate medications drawn from the New Zealand Criteria. The system is designed to scan records from hospitals and emergency departments, along with data on subsidised medicine dispensings from pharmacies across New Zealand [13]. It targets individuals aged 65 years and older who are prescribed 11 or more subsidised medicines listed in the New Zealand Pharmaceutical Schedule [15].

The tool evaluates whether each patient meets any of the PIM indicators and ranks them according to the total number of indicators present. PolyScan generates reports at different levels of detail, highlighting the most frequent PIM indicators across a clinic, listing patients with indicators under each prescriber's responsibility, and providing specifics on the indicator, the prescribing clinician, and the dispensing pharmacy for affected individuals.

Study population

Recruitment of the general practice clinic

Participants were enrolled from a single New Zealand general practice over a four-week window spanning May to June 2021. In New Zealand, these clinics function as primary healthcare centres for a wide range of older patients, delivering services that include long-term condition management, medicine prescribing, and referrals to specialists [16]. The lead researcher (LL) visited the clinic to explain the research and secured approval from the chief executive officer, who provided formal written consent for the clinic's involvement.

Recruitment of the pharmacist

The pharmacist responsible for implementing the intervention needed to meet the following criteria: (1) holding a valid Annual Practising Certificate in New Zealand, (2) possessing a postgraduate qualification in clinical pharmacy from a university, and (3) having prior experience working in general practice settings.

Recruitment of patients

The clinic's registered patient population was screened using PolyScan to identify potentially suitable candidates, who were subsequently approached by clinic staff. As outlined earlier, PolyScan flagged individuals aged 65 years or older who were taking at least 11 subsidised medicines and who exhibited one or more PIM indicators. Choosing the threshold of 11 or more medications as an eligibility requirement reflected both its clinical significance and compatibility with PolyScan's reporting capabilities. This cutoff aimed to capture patients facing particularly intricate medication regimens, substantial treatment burden, and elevated risk of harm related to medicines.

Patients expressing interest were selected through convenience sampling if they fulfilled these conditions: (1) aged 65 years or above, using 11 or more medications with PIMs as detected by PolyScan, (2) registered at the participating clinic, and (3) capable of giving informed consent. Those who did not satisfy these requirements were not included. The researcher (LL) formally enrolled eligible individuals after supplying them with an information sheet and obtaining their signed consent. The enrolled patients were aged between 70 and 88 years, consisting of five New Zealand European and five New Zealand Māori participants. Most were women (n = 8) compared to men (n = 2). Their daily medication counts varied from 11 to 13.

The pharmacist-led intervention

The intervention process is illustrated in **Figure 1**, which details the steps of patient identification, educational outreach to clinicians, comprehensive medication review, and subsequent follow-up.

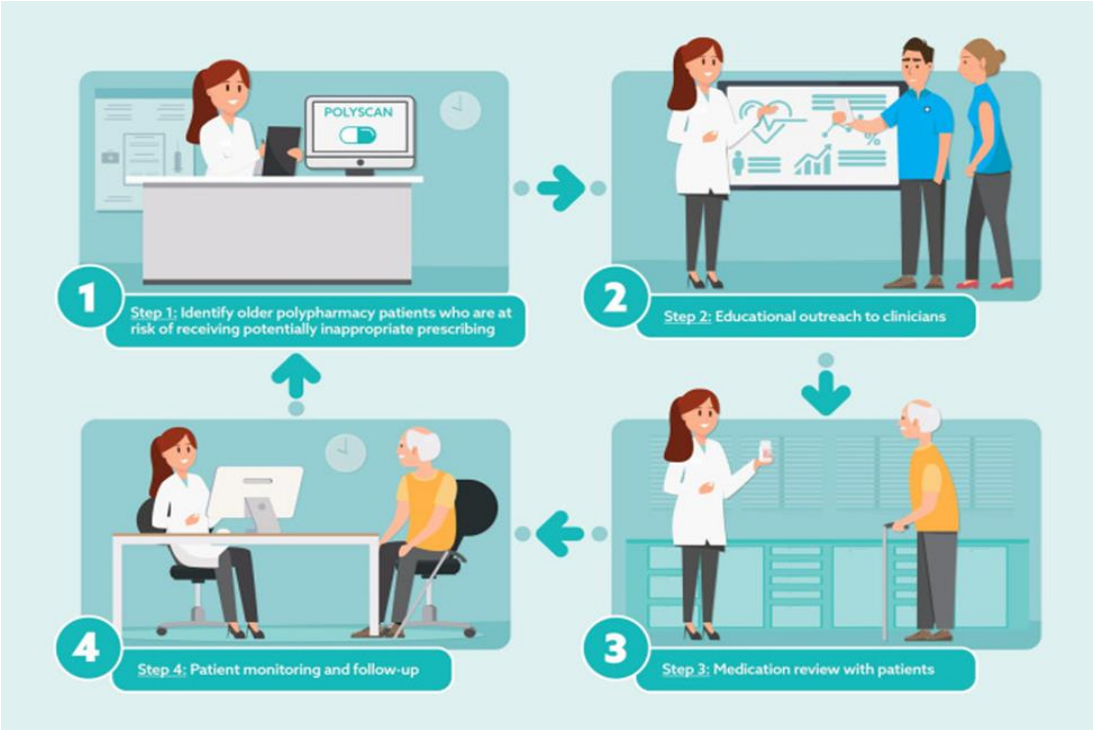

Figure 1. Overview of the pharmacist-led intervention procedures

PolyScan was employed to detect elderly patients experiencing polypharmacy and exhibiting potentially inappropriate medication indicators within the participating general practice. Following this, the pharmacist arranged meetings with the clinic's healthcare providers to: (1) review the results produced by PolyScan, (2) deliver education regarding problematic polypharmacy and evidence-based principles for appropriate medicine prescribing, and (3) collaboratively establish a strategy for performing medication reviews for identified patients. The core component of the medication review consisted of the pharmacist performing a Medication Therapy Assessment (MTA). In the New Zealand healthcare context, an MTA represents a structured medication management service delivered by pharmacists with advanced clinical training as part of interdisciplinary teams. It is defined as "a systematic, patient-centred clinical assessment of all medicines currently taken by a patient" [17]. For each MTA, the pharmacist was given 30 minutes to conduct a face-to-face consultation with the patient, either at the clinic or in the patient's home. Further information on the MTA protocol can be found in Online Resource 1.

Finally, the pharmacist monitored each patient's response to their medications, evaluating both effectiveness and safety, and conducted follow-up with the patient, their general practitioner, and any other involved members of the healthcare team as needed.

Preliminary feasibility assessment

Table 1 presents the specific measures applied to evaluate whether the various procedures and processes of the intervention could be implemented according to the original design. These measures were constructed in accordance with the recommendations for pilot and feasibility studies outlined by Thabane *et al*. [18]. In addition, a patient-reported outcome measure (PROM) was included, along with an analysis of perspectives gathered from patients and clinicians.

Table 1. Preliminary feasibility assessment measures

Assessment measure	Data type	Data collection and analysis procedure	Data collection time-point
Rate of patient recruitment	Quantitative	Proportion of patients who provided consent relative to the total number of eligible individuals* detected by PolyScan	One month following completion of medication reviews
Application of inclusion and exclusion criteria	Quantitative	Comparison of clinic referrals against the number of eligible patients identified post-screening Reasons for excluding patients were derived from researcher field notes	One month following completion of medication reviews
Rates of acceptance and refusal to participate	Quantitative	Proportion of eligible referred patients relative to those who consented to join Reasons for refusal or participation obstacles were evaluated using researcher field notes	One month following completion of medication reviews
Patient compliance with the study protocol	Quantitative	Count of patients who failed to finish the medication review and LMQ-3	Immediately after each medication review and at the 8-week follow-up
	Qualitative	Causes of non-compliance with the protocol were examined through thematic analysis	
Duration required to deliver the intervention	Quantitative	Recorded time needed to perform the medication review and administer the LMQ-3	Immediately after each medication review and at the 8-week follow-up

Rate of patient retention	Quantitative	Proportion of signed consent forms relative to requests for withdrawal Reasons for dropping out were reviewed from researcher field notes	At the 8-week follow-up
Effectiveness of PolyScan in data gathering and handling	Quantitative	Comparison of patients* flagged by PolyScan against a manual check conducted on 300 individuals aged 65 years or older	At the start of the study
Patient comprehension of the intervention	Qualitative	Questions raised by patients regarding the intervention were evaluated using thematic analysis	Immediately after each medication review and at the 8-week follow-up
Patient capacity to undertake the intervention and complete the questionnaire	Qualitative	Difficulties encountered by patients during the intervention and with the LMQ-3 were assessed via thematic analysis	Immediately after each medication review and at the 8-week follow-up
Suitability of the intervention delivery setting	Qualitative	Concerns expressed by patients about the venue used for the intervention were analysed thematically	Immediately after each medication review and at the 8-week follow-up
Acceptability of the intervention among clinicians	Quantitative	ATCI-GP questionnaire results were computed by summing item scores and dividing by the total number of items to yield a score out of five	At the 8-week follow-up
Completion of the intervention	Quantitative	Count of pharmacist suggestions adopted by general practitioners, obtained from clinic documentation	At the 8-week follow-up
Patient-reported outcomes associated with the intervention	Quantitative	LMQ-3 results were derived by summing the scores across all questionnaire items	Immediately after each medication review and at the 8-week follow-up
Patient satisfaction regarding the intervention	Qualitative	Expressions of patient satisfaction with the intervention were examined through thematic analysis	Immediately after each medication review and at the 8-week follow-up

ATCI-GP, Attitudes towards collaboration instruments for general practitioners questionnaire; CF, Consent form; GP, General practitioner; LMQ-3, Living with medicines questionnaire version 3 *Older adults aged 65 years and over, taking 11 or more medications daily, and with potentially inappropriate medications

Immediately after each medication review, the researcher (LL) visited patients either at the clinic or in their homes to conduct a health-related evaluation. Patients were given 15 minutes to fill out the Living with Medicines Questionnaire version 3 (LMQ-3), a patient-reported outcome measure designed to assess their overall health status and experiences with medication use [19]. An additional follow-up session was scheduled 8 weeks later, during which patients completed the LMQ-3 again.

The LMQ-3 comprises 41 items that patients complete independently, each rated on a five-point Likert scale ranging from “strongly agree” to “strongly disagree.” These items are organised into eight domains, and domain scores are summed to produce an overall total; higher totals reflect a greater perceived burden from medications [19]. The questionnaire also incorporates a visual analogue scale on which patients can indicate their general sense of medication burden, from “no burden at all” to “extremely burdensome” [19]. The LMQ-3 was chosen for this research because it has previously been used to evaluate interventions targeting polypharmacy in older adults [20] and because it has been validated for use in the New Zealand context [21].

To capture patient perspectives, the researcher (LL) carried out semi-structured interviews with patients at the clinic or in their homes immediately following each medication review. A follow-up interview was conducted 8 weeks later to explore patients’ views on the intervention’s effects. The interview guide was semi-structured and

adapted from the work of Beyene *et al*. [22]. The full list of interview questions is provided in Online Resource 2.

To obtain clinician perspectives, general practitioners at the clinic anonymously completed the Attitudes Towards Collaboration Instruments for General Practitioners questionnaire 8 weeks after the medication reviews were finished [23]. This instrument contains 13 self-administered items rated on a five-point Likert scale, with higher scores indicating more favourable attitudes toward collaboration with pharmacists [23].

Data Analysis

Quantitative data were examined to evaluate the study's predefined progression criteria, which guided the decision on whether to advance to a full-scale trial of the intervention **(Table 2)**. These criteria were formulated drawing on established recommendations from Rankin *et al*. and Avery *et al*. [24, 25]. Qualitative data were subjected to thematic analysis to identify and interpret patient perspectives, adhering to the stepwise approach outlined by Nowell *et al*. [26]. The detailed protocol for the thematic analysis is available in Online Resource 3.

Table 2. Study progression criteria

Assessment measure	Stop	Amend	Go
Patient recruitment	≤ Four patients recruited in the 4-week recruitment period	Five to seven patients recruited in the 4-week recruitment period	≥ Eight patients recruited in the 4-week recruitment period
Patient retention rate	≤ 49.0% of patients retained at 8-week follow-up	50.0%–79.0% of patients retained at 8-week follow-up	≥ 80.0% of patients retained at 8-week follow-up
Patient adherence to the study protocol	≤ 49.0% of patients completed the medication review and LMQ-3 in its entirety	50.0%–79.0% of patients completed the medication review and LMQ-3 in their entirety	≥ 80.0% of patients completed the medication review and LMQ-3 in their entirety
Description	**Stop**	**Amend**	**Go**
	A full-scale trial is not feasible if one or more assessment measures meets the 'Stop' criteria	A full-scale trial is feasible with modifications to the protocol if the assessment measures meet the 'Amend' criteria	A full-scale trial is feasible without modifying the protocol or amendments to the protocol if the assessment measures meet the 'Go' criteria

LMQ-3, Living with Medicines Questionnaire version 3

Results and Discussion

Quantitative results

In the recruitment phase spanning May to June 2021, the general practice clinic had a total enrolled population of 2,259 patients, of whom 215 were aged 65 years or older. Following the application of PolyScan for screening, the clinic referred 23 potentially suitable patients to the study **(Figure 2)**. Among these 23 individuals, 15 satisfied the inclusion criteria and were enrolled, whereas eight were deemed ineligible. The reasons for exclusion comprised disenrollment from the clinic (n = 4), inability to provide independent informed consent (n = 3), and death of the patient (n = 1).

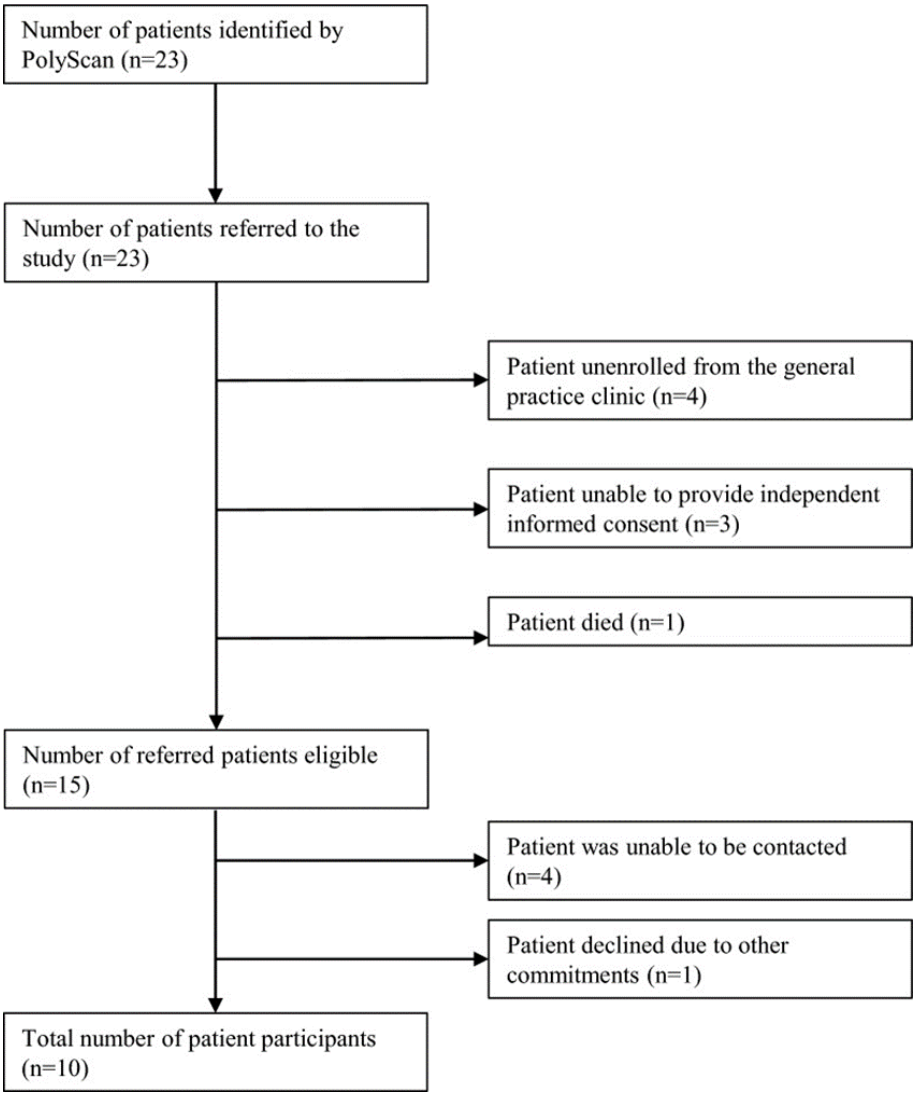

Figure 2. Summary flowchart of patient recruitment

Among the 15 patients who were referred and fulfilled the inclusion criteria, ten consented to take part in the study, whereas five were not included. The grounds for non-inclusion were failure to establish contact (n = 4) and refusal owing to prior obligations (n = 1). One participant withdrew prior to the 8-week follow-up because of health issues. The overall patient retention rate stood at 90 percent.

In terms of patient compliance, every participant finished both the medication review and the baseline LMQ-3. The median duration for conducting each medication review was 60 minutes. The median time required to administer the LMQ-3 was 12 minutes at both the initial assessment and the follow-up visit.

With respect to the accuracy of PolyScan, as previously detailed by Liu *et al*. validation testing showed that PolyScan correctly identified nine individuals with polypharmacy and PIMs from a sample of 300 older adults. When benchmarked against manual screening, PolyScan demonstrated 100.0% sensitivity, specificity, positive predictive value, and negative predictive value [13].

Concerning acceptability among clinicians, all six general practitioners at the clinic filled out the Attitudes Towards Collaboration Instruments for General Practitioners questionnaire. The overall scores ranged from four to five on the five-point scale. Detailed questionnaire outcomes are available in Online Resource 4.

In relation to intervention implementation, the median number of recommendations issued by the pharmacist was two per patient. By the 8-week follow-up, the median number of these recommendations acted upon by general practitioners was one per patient.

The burden associated with medications for patients was measured via the LMQ-3 (see **Table 3** for an overview of findings). At the 8-week follow-up, LMQ-3 scores improved (decreased) for six patients, reflecting reduced medication burden, while they worsened (increased) for three patients. On the LMQ-3 visual analogue scale,

scores improved (decreased) for five patients, worsened (increased) for two patients, and stayed the same for two patients. Full results are provided in Online Resource 5.

Table 3. Summary of living with medicines questionnaire version 3 (LMQ-3) results at the initial appointment and at 8-week follow-up

Patient (initial /follow-up appointment)	Total LMQ-3 score categorised	Total LMQ-3 score	LMQ-3 visual analogue scale score categorised	LMQ-3 visual analogue scale score
A—initial	Moderate burden	89	Minimal/no burden	0
A—follow-up	Moderate burden	98	Minimal/no burden	1
B—initial	Low burden	87	Minimal/no burden	3.5
B—follow-up	Moderate burden	95	Minimal/no burden	0.5
C—initial	High burden	115	Some degree of burden	5
C—follow-up	Moderate burden	108	Minimal/no burden	2.5
D—initial	Low burden	72	Minimal/no burden	0
D—follow-up	Low burden	85	Minimal/no burden	0
E—initial	Moderate burden	103	High degree of burden	7
E—follow-up	Moderate burden	93	Minimal/no burden	1
F—initial	Moderate burden	96	High degree of burden	6.5
F*—follow-up	N/A	N/A	N/A	N/A
G—initial	Low burden	77	Some degree of burden	4
G—follow-up	Low burden	74	Some degree of burden	5
H—initial	High burden	112	Minimal/no burden	1
H—follow-up	Moderate burden	90	Minimal/no burden	0
I—initial	High burden	118	High degree of burden	8
I—follow-up	Moderate burden	90	Minimal/no burden	0
J—initial	Moderate burden	99	Minimal/no burden	0
J—follow-up	Low burden	79	Minimal/no burden	0

Total LMQ-3 score categories: score 41–87 = low burden, score 88–110 = moderate burden, score > 110 = high burden

LMQ-3 visual analogue scale score categories: score 4.0 or lower = minimal/no burden, score 4.1–5.9 = some degree of burden, score 6.0 or higher = high degree of burden

*Patient F withdrew from the study before the 8-week follow-up

Qualitative results

Analysis of the patient interviews revealed five main themes: (1) satisfaction with the intervention, (2) appropriateness of the location for delivering the intervention, (3) understanding of the intervention and questionnaire, (4) ability to complete the intervention and questionnaire, and (5) adherence to the study protocol. These themes, along with their associated sub-themes, are illustrated visually in **Figure 3**.

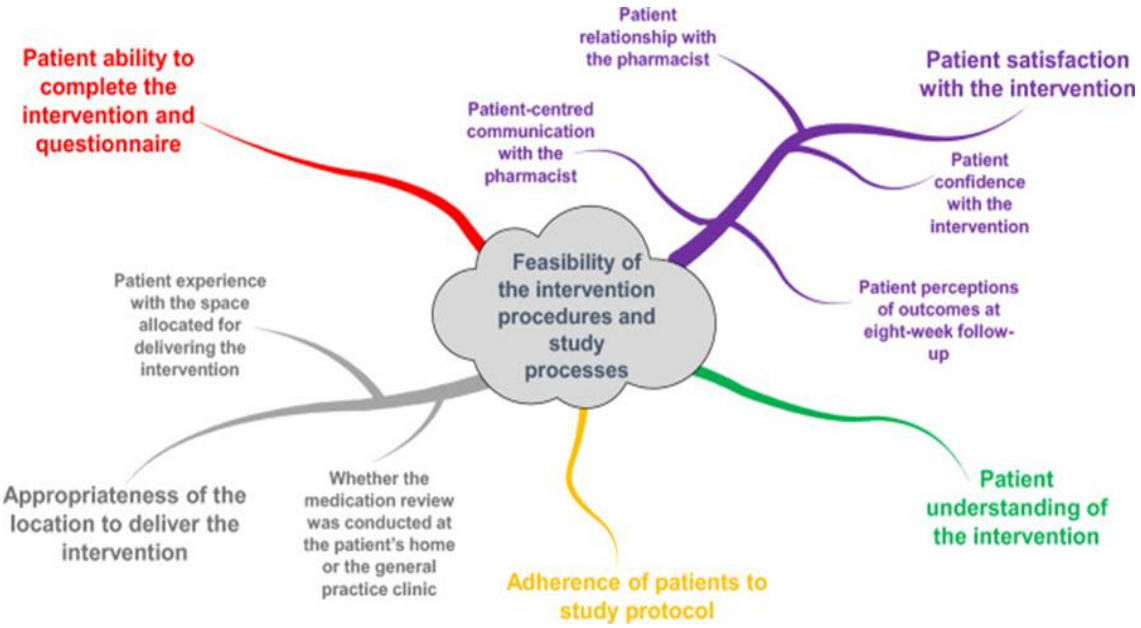

Figure 3. Concept map displaying themes and sub-themes

Theme 1: patient satisfaction with the intervention

Subtheme 1: patient relationship with the pharmacist

The majority of participants formed a favourable connection with the pharmacist, reporting ease in sharing their worries, sensing the pharmacist's sincere concern for their health, and having confidence in the pharmacist's guidance on medication choices and overall care.

One participant, however, believed the pharmacist made presumptions without sufficient knowledge of her medical history and that a sense of mutual trust was not achieved. This participant recommended that the pharmacist demonstrate familiarity with her health background to foster trust and enable joint development of care strategies.

Subtheme 2: patient-centred communication with the pharmacist

Most participants described positive interactions regarding the pharmacist's communication style, noting that adequate time was given to hear their health issues, that their needs were well understood, that explanations were clear and accessible, and that they were actively included in medication-related decisions.

One participant raised issues about the pharmacist's grasp of her specific health requirements, mentioning the use of technical language and suggesting that individuals who find it hard to articulate themselves could feel overwhelmed. To enhance communication, this participant advised using straightforward language, speaking more slowly, presenting information gradually, establishing greater rapport, and inquiring about the reasons patients take particular medicines.

Sub-theme 3: patient confidence with the intervention

The majority of participants expressed trust in the pharmacist's expertise, contentment with the duration of the medication review, and the view that similar services would benefit other individuals.

Certain participants indicated a desire for additional interactions to create a continuing relationship with the pharmacist. The participant who had earlier voiced reservations proposed that a preliminary session to outline the review process, explore personal health objectives, and address worries would be advantageous.

Sub-theme 4: patient perceptions of outcomes at eight-week follow-up

The majority of participants were happy with the results of the intervention. Around half considered the changes beneficial, and most reported no difficulties or negative effects.

One participant described unfavourable results, stating that although the pharmacist behaved properly, the changes were not useful and resulted in harmful effects. This participant emphasised the need for the pharmacist to

recognise her individual health circumstances and to note that some medicines serve multiple purposes, which ought to be discussed with her physician.

Theme 2: appropriateness of the location to deliver the intervention

Sub-theme 1: whether the medication review was conducted at the patient's home or the general practice clinic

The majority of participants had their medication reviews carried out in their own homes, with only one review taking place at the clinic.

Sub-theme 2: Patient experience with the space allocated for delivering the intervention

Participants were content with the setting of their medication review, whether at home or in the clinic, feeling able to speak freely and confidentially in either location. The majority favoured in-person reviews rather than those conducted via video or phone.

Theme 3: patient understanding of the intervention

The majority of participants reported a clear grasp of the intervention, finding the initial explanation straightforward.

A few participants wondered about the scope of the intervention and worried it might be seen as focused primarily on decreasing the number of medicines. They recommended explicitly describing the components of the medication review and reassuring individuals that the goal is not simply reduction but confirmation that all prescribed medicines remain suitable.

Theme 4: patient ability to complete the intervention and questionnaire

The majority of participants reported no difficulties with any part of the intervention or the associated questionnaire.

When questioned about potential challenges for other elderly individuals, participants noted that certain people might struggle with technical terms or feel reluctant to seek out the service. They emphasised the importance of reaching out to those who live alone or tend to be more isolated, suggesting that the pharmacist should take the initiative to make contact and establish a collaborative relationship.

Theme 5: adherence of patients to study protocol

Most participants indicated that they were able to finish all required forms and the medication review without issue. They reported no questions that seemed unclear or irrelevant.

Treating individuals with multiple health conditions presents significant difficulties owing to the intricate nature of their medical profiles and prescribing patterns, compounded by the limited consultation time available to healthcare providers. The present research aimed to assist practitioners by conducting an initial evaluation of the practicality of an approach intended to enhance medicine utilisation and minimise potentially inappropriate medicines among elderly patients experiencing polypharmacy.

The operational elements and protocols of the approach satisfied the predefined evaluation benchmarks, with rates of participant enrollment, ongoing involvement, and compliance with the procedural guidelines achieving the thresholds required to justify a larger-scale assessment. Furthermore, participants reported that the approach was straightforward to comprehend, posed no substantial difficulties in participation, and expressed contentment with the LMQ-3 instrument. Clinicians completing the Attitudes Towards Collaboration Instruments for General Practitioners questionnaire similarly indicated favourable views regarding partnership with the pharmacist.

Despite fulfilling the initial practicality benchmarks, the investigation uncovered important observations that point to the need for refinements in design prior to a comprehensive trial.

Successful enrollment of participants continues to represent a major obstacle, and the eligibility requirements ought to be broadened to encompass individuals incapable of giving independent consent. Securing agreement from a legal guardian or holder of enduring power of attorney would prevent the exclusion of such patients from a potentially beneficial approach. Moreover, the current eligibility threshold of 11 or more medicines was applied here. Considering the diversity in numerical definitions of polypharmacy [4], reducing this minimum in a subsequent trial could enlarge the pool of suitable candidates.

To foster better mutual comprehension and rapport between participants and the pharmacist, an introductory session should be scheduled to cover the approach and the participant’s health concerns. It must also be recognised

that this approach was neither designed nor able to substitute for Māori-led programmes tailored for indigenous New Zealand populations, such as the medication optimisation initiative for Kaumatua described by Hikaka *et al*. [27]. Nevertheless, to promote cultural appropriateness for Kaumatua, incorporating Lacey *et al*.'s 'Hui Process' as a guiding structure for the introductory session and follow-up interactions could strengthen relationship development and guarantee cultural safety [28].

Pharmacists administering the approach should undergo training focused on consultation techniques to maintain a participant-focused orientation throughout the review. A forthcoming training module could draw on Wolters *et al*.'s model for participant-centred dialogue [29] together with the consultation skills curriculum developed by Grimes and Barnett *et al*. for enhancing communication, consultation proficiency, and health coaching abilities [30].

Although participants voiced approval of the LMQ-3 as a patient-reported outcome measure, this tool lacks certain critical attributes needed to serve effectively as a primary endpoint in a subsequent clinical trial. Any future selected measure should supply evidence regarding responsiveness to change, minimally important clinical differences, and expected baseline values. Relevant supporting data for the LMQ-3 remain scarce in published literature.

The duration of the 8-week follow-up warrants review, given that some pharmacist suggestions had not yet been actioned by general practitioners operating on three-month prescribing cycles. Extending this interval would afford clinicians additional opportunity to evaluate recommendations and detect beneficial or adverse consequences that may emerge only over extended periods [31, 32].

The scheduled time for individual medication reviews should be increased to 60 minutes. That said, the resource implications of this extension must be weighed for healthcare providers and funding bodies, as it could demand greater staffing and affect service capacity. It should be acknowledged, however, that the reviews conducted here were thorough and addressed patients with highly complicated regimens, necessitating more time than routine consultations for single issues. Evidence also demonstrates that dedicating time to detailed medication reviews can yield downstream efficiencies and cost reductions by averting drug-related adverse events, streamlining prescribing processes, and allowing clinicians to allocate effort elsewhere [33-35].

Globally, numerous strategies have been created to tackle problematic polypharmacy in elderly populations. A Cochrane systematic review identified 38 pertinent trials [36]. Examples include Basager *et al*.'s evaluation of a prescribing suitability tool applied during reviews for Australian older adults on at least five medicines [37], Campins *et al*.'s examination of a medication optimisation programme for community-residing Spanish elders taking eight or more drugs [38], and Muth *et al*.'s investigation of a multifaceted strategy to improve prescribing appropriateness for German older adults using five or more medications [39].

No individual strategy has emerged as unequivocally superior, and many reports provide insufficient detail on development and delivery, hindering optimisation and adaptation to other contexts [36]. The current investigation adds to this body of work by presenting an approach distinguished by its integration of PolyScan for detecting elderly patients with polypharmacy and PIMs, as well as by its rigorous application of structured development and execution methods, setting it apart from numerous prior efforts.

A major asset of this research was the methodical and transparent framework employed to appraise the approach. Clear quantitative and qualitative benchmarks, together with explicit progression thresholds, were utilised to judge procedural viability. Limitations were nonetheless present. All participants received the active approach to examine targeted operational aspects, meaning elements typical of a full trial—such as control group recruitment, random allocation, and concealment—were not addressed. The sample was modest and follow-up brief, though the design prioritised feasibility rather than long-term efficacy. Blinding of the pharmacist and clinic was not implemented, potentially influencing practitioner conduct and reported results. Finally, although standard analytic techniques were applied to qualitative material, the interviewer's role in designing the approach may have introduced bias; an external interviewer could have mitigated this but was impractical given resource constraints.

Evidence supports the value of pharmacist-led initiatives in community settings for improving patient safety through reductions in drug-related harm, prescribing errors, and hospitalisations [40-42]. By working closely with colleagues, pharmacists can elevate overall care standards and patient protection [43]. Consequently, incorporating pharmacists via this model represents an encouraging avenue for general practices aiming to upgrade services and outcomes, meriting additional investigation.

For investigators, this work illustrates application of the Medical Research Council's recommended guidance for complex intervention development and appraisal [14]. Despite its publication in 2008, few polypharmacy-focused

studies for older adults have explicitly adopted it [36]. Upcoming projects could gain from employing this structure to promote reproducibility and real-world applicability.

Finally, the research highlights the value of prior practicality testing for procedural components—a step frequently neglected despite its importance [44]. Future feasibility investigations may profit from the combined quantitative-qualitative methodology demonstrated here.

Conclusion

This investigation confirms that integrating the approach within community practice settings is practicable, although refinements are required ahead of a large-scale randomised trial.

The subsequent stage will involve designing a cluster-randomised controlled trial for the refined approach, incorporating the adjustments highlighted here and specifying elements such as trial length, initial data gathering, primary endpoints, required sample size, allocation procedures, blinding, analytic plans, plus economic and implementation assessments to explore cost-efficiency and obstacles to adopting pharmacist suggestions.

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Ethics Statement: None

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