Homecare safety and medication management: a scoping review of the quantitative and qualitative evidence

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Review question/objective

This review will be guided by the following research questions:

1. What are the range of issues encountered by individuals, families, caregivers, and healthcare providers related to the medication management of individuals living in the community and receiving homecare services?
2. What are the documented errors or adverse events that occur in this population that relate to the management of medications?
3. What strategies have been implemented and evaluated that address the issues encountered by this population?
Background

Introduction

Patient safety is a current national and international priority, and one of the most prevalent, high-risk fields within patient safety is medication safety.\textsuperscript{1-4} The links in the chain of events necessary for medication safety include assessment, prescription, dispensing, and monitoring of medications. A weakness in any one of these essential links or a tenuous connection between links may result in an adverse event and harm to the patient. While medication safety in general demands consideration, there is a critical gap in our understanding of medication safety in the home care sector. Understanding what factors contribute to, and/or reduce the risk of adverse drug events in the home setting will enable the identification and promotion of safer medication administration practices.

Key Definitions

Homecare research and literature is rife with inconsistent terminology related to roles. Thus, discussion of medication safety in homecare necessitates clarification of terms. For the purposes of this discussion, caregivers refers to family members or friends in a paid or unpaid role who are responsible for or charged with caring for the patient. Family members are individuals identified by the patient and/or caregiver as being close to the patient through blood, legal, or emotional ties, and who may or may not reside in the same home as the patient. Finally, providers are employees of organizations providing homecare services. Providers may be professionals or non-professionals, and regulated or unregulated (e.g. case managers, nurses, aides, pharmacists, and therapists.)

Compromised Medication Safety for Older Adults

When medications are not managed safely, the associated costs for patients, their caregivers/families, providers, and the healthcare system can be severe.\textsuperscript{4-10} There is limited evidence from the international literature on safety in homecare or safety in medication management in home care. However, Canadian studies indicate that as many as one in five hospitalized Canadians suffer adverse events following their discharge home, and two thirds of those events are related to compromised medication safety.\textsuperscript{11-13} Furthermore, patients themselves have identified problematic outcomes related to insufficient medication safety processes. For example, in the Commonwealth Survey (2002), 11\% of Canadian patients reported that they received an incorrect medication at least once.\textsuperscript{14} Medication safety issues are often augmented for older adults. Management of multiple chronic illnesses as well as other care needs frequently compounds the complexity of the medication regimens common in this population. In Canada’s seniors, the total annual cost of preventable drug-related morbidity (PDRM) was estimated to be $11 billion in 2000.\textsuperscript{7} In addition, a recent study observed that up to one in 11 seniors in Halifax, Nova Scotia experienced a PDRM within a two-year period.\textsuperscript{15} Many of these lapses in medication safety occur in patients’ homes. Because of the myriad of issues faced by elderly homecare recipients, this review will focus on medication safety issues for older adults who receive homecare services, their caregivers/families, and providers.
Complexity of Care in the Home

Homecare is inherently complex, and the demands on the knowledge, ability, energy, and finances of patients and their families/caregivers are intensifying as a result of increasing acuity of patients, decreasing length of hospital stays, and increasing availability of mobile health care technology such as peritoneal and hemodialysis, long term intravenous catheters, and oxygen/inhalation therapy. Family relationships, the home environment, which is not designed for providing health care, and the cognitive and physical abilities of both patients and caregivers further influence care provision.

While in-hospital, care is predominantly the responsibility of regulated professional providers who work in shifts whereas unregulated providers, family, and caregivers provide much of the care in private homes. Caregivers for home care patients are frequently elderly, and they often grapple with health challenges of their own in addition to lack of sleep as they provide around-the-clock care with little assistance or relief. Family and caregivers often agree to care for patients at home out of love and/or a sense of responsibility, but are unaware of the extent of the commitment involved and the drastic impact it can have on their own lives and health. Additionally, providers who work in patients’ homes are exposed to the risks inherent in providing care alone in an unregulated and potentially ill-equipped setting. Thus, the safety of the patient, caregiver/family, and provider are inextricably linked, and the care and safety of patients around medication management cannot be addressed without including caregivers, family members, and providers in the equation.

Medication Safety in Homecare

Current medication safety research focuses predominantly on institutions and paid providers. This research may have little applicability to the homecare setting, just as the traditional means of identifying and describing medication errors (e.g. “drug without indication” or “indication without drug”) may be neither sufficient nor practical for homecare. Assessing medication-related problems in the home often demands consideration of issues that are often irrelevant in the hospital setting. Examples of these are economic issues, such as whether the patient can afford to fill his or her prescriptions; access issues, such as whether the patient has the physical capacity to get to a pharmacy; and social issues, such as living with an overwhelmed caregiver who has his or her own health concerns.

Additionally, there is a great deal of variation in the abilities of caregivers, many of whom are lay people with no formal health care training. There is little in the way of education or preparation for these caregivers, who manage an array of medications in potentially ill-equipped home settings, frequently while under the influence of stress and fatigue. Though providers can help to alleviate risks through assessment and collaborative discussions with patients and caregivers, the nature of the home setting requires patients and caregivers to make frequent autonomous decisions about medication use with minimal professional supervision, and deficient or absent home and community supports. In addition, the home setting presents unique difficulties in documentation and communication related to medications. Research shows points of transfer across sectors already hold increased challenges in these essential functions. One related danger to homecare patients is the implications of insufficient communication for medication reconciliation, defined as the “systematic and comprehensive review of all the medications a patient is
taking to ensure that medications being added, changed or discontinued are carefully assessed and documented."\textsuperscript{26,p.5} As the potential for receiving inappropriate medication increases, so too does the potential for harmful incidents (an incident which results in harm to a patient).\textsuperscript{27,p.23}

Shifting Perspective: New Knowledge Requirements

Homecare continues to be chronically under-funded within a health care system dominated by the acute care setting, despite an ever-increasing demand for homecare services. Health care strategies for the elderly, including seniors with chronic conditions and those that need end-of-life care, require a fundamental change in perspective. This change is necessary from a short-term, disease-oriented perspective with an emphasis on diagnosis and treatment, as well as from a long-term perspective with an emphasis on functional capacity, health maintenance, prevention of further deterioration, health promotion for the patient and caregivers/families, as well as comfort and supportive care.

This shift in perspective calls for a new set of competencies (education, skills), and alternative approaches (including behavioral strategies) to care for these patients and caregivers/families. The safety implications for medication management in home care need to be addressed in relation to service provision for vulnerable patients (i.e., elderly, chronically and/or terminally ill), ethical considerations for the myriad of daily decisions in homecare, and the critical role of patients, caregivers, and family members as integral members of the health care delivery team.

In line with the view proposed by the Canadian Institutes for Health Research (CIHR), “Decision-makers need information and implementation strategies on how to shift from a world of acute care solutions for chronic care needs to a world of chronic care solutions for chronic care needs,”\textsuperscript{28} this review will explore existing knowledge related to medication management from a safety perspective for older adults receiving home care as well as their caregivers, families and providers. Examining existing research related to the issues and challenges faced by this population, as well as any strategies used to mitigate or ameliorate safety risks, will illuminate gaps in current knowledge, identify priority research areas, and advance patient safety research in home care.

The following explanations/definitions are relevant to the review:

Homecare services personnel

- Homecare services are the provision of care by a licensed or unlicensed health care provider who is contracted with a home-care agency.
- Include any paid caregiver, (regulated or unregulated), with or without training, including personal support workers, home support workers, health care aides and lay health care workers.

Homecare services

- Include services to address the treatment of any health condition but must specifically address medication management.

Home-dwelling

- Home-dwelling includes people living at home, with friends or family, in retirement homes, senior's
apartments, residential centers, or communal residences.

This review will be a mixed method (quantitative and qualitative) scoping review to establish the state of knowledge on this topic in the current research literature. It is anticipated that the scoping review will provide an indication of areas to explore further and at greater depth using systematic review methodology.

An initial search of the Joanna Briggs Institute Library and the Cochrane Library, Medline and CINAHL has been done and has determined that there are no previous reviews done on this topic.

Keywords
Medication; management; medication; mismanagement; medication errors; inappropriate medication; adverse events; homecare (home care); homecare safety

Inclusion criteria
Types of participants
The quantitative component of this review will consider studies that include individuals, mean age 65 years or older, who are receiving homecare services that specifically include medication management. The reason for stipulating mean age as 65 years or older is that this review will be supporting a study focused on this particular age group – hence it is relevant to limit the population to this age range. The search of the literature has not been limited by age and should we find a significant volume of literature addressing the 'young old' i.e., 55-64 years, we will consider changing this criterion to include this additional set. Studies that focus on formal caregivers (licensed or unlicensed) and informal caregivers (family/friends (paid or unpaid)) who are involved in the medication management process will be included.

The qualitative component of this review will consider studies that investigate the experience of individuals, mean age 65 years or older, who are receiving homecare services that specifically include medication management. The experience of formal caregivers (licensed or unlicensed) and informal caregivers (family/friends (paid or unpaid)) who are involved in the medication management process will be included.

The following topics and settings will not be included in this review:
1) Individuals performing self-care at home but not receiving homecare services.
2) Hospital, Hospital-at-Home, acute care services.
3) Assisted living facilities, long term care, nursing homes
4) Palliative care.
5) Acute exacerbation of chronic illness.
6) Home services for situations not considered 'a health condition,' e.g., midwives for home births; respite services; environmental services (maintenance); programs to prevent child abuse; fire prevention.

7) Mental health services/psychiatric care provided at home.

**Types of intervention(s)/phenomena of interest**

The quantitative component of the review will consider studies that evaluate the process of medication management involving either formal caregivers (licensed and unlicensed) or informal caregivers (family/friends (paid or unpaid)).

**Comparator**

For the quantitative research, the comparators may be: a) different community settings (home care versus residential units or long term care facilities); b) within or between home care agency settings (across cities, states, provinces or countries); or c) different caregivers - formal (licensed and unlicensed) or informal caregivers (family/friends (paid or unpaid)).

The qualitative component of this review will consider studies that investigate the experience of the individual receiving medication from caregivers or the experience of the caregivers (formal and informal) administering the medication.

**Context**

The context of this review is the community of those individuals living in a community setting and receiving homecare services.

**Types of outcomes**

In this review we will consider a variety of outcomes, including but not limited to:

- Deaths, rehospitalization, emergency room use, adverse drug reactions
- Adherence and compliance rate
- Wellbeing (self-efficacy, self-reported wellbeing scale, quality of life scale, caregiver burden)
- Confidence to continue medication administration
- Deterioration in primary condition
- Experience of medication management
  - Individual report
  - Caregiver report
Types of studies

In this review, we will include all quantitative and qualitative research designs. The quantitative component of the review will consider research designs such as, but not limited to, experimental designs (randomized controlled trials, controlled clinical trials, controlled before and after trials, time series studies) and observational designs (descriptive studies, cohort studies, cross sectional studies, case studies and case series studies).

The qualitative component of this review will consider research designs such as, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research and feminist research.

Search strategy

The search strategy will be completed with the assistance and guidance from a library scientist (MS) with experience in search methodologies for the systematic review processes. Because this is a scoping review and the intent is to map out the existing research on this topic, the search strategy will aim to find only published studies. A three-step search strategy will be utilized in this review. An initial limited search of MEDLINE and CINAHL will be undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe article. A second search using all identified keywords and index terms will then be undertaken across all included databases. Thirdly, the reference list of all identified reports and articles will be searched for additional studies. Studies published in English and French will be considered for inclusion in this review. Studies published in other languages will be tallied (but not translated) to provide an indication of the range of international literature available on this topic. No date limitation will be imposed upon the search strategies.

The databases to be searched include:

MEDLINE, CINAHL, PsycINFO, EMBASE, AMED, HEALTHSTAR

Assessment of methodological quality

This review will be a scoping review to provide a broader picture of the existing literature on this topic. Hence assessment of methodological quality will not be performed.

Data collection

Quantitative data will be extracted from papers included in the review using the standardized data extraction tool from the Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) (Appendix I). The data extracted will include specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific
objectives.

Qualitative data will be extracted from papers included in the review using the standardized data extraction tool from the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) (Appendix I). The data extracted will include specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives.

Data synthesis

For the quantitative research findings, heterogeneity will be assessed statistically using the standard Chi-square and also explored using subgroup analyses based on the different study designs included in this review. Where statistical pooling is not possible the findings will be presented in narrative form including tables and figures to aid in data presentation where appropriate.

Qualitative research findings will, where possible be pooled using JBI-QARI. This will involve the aggregation or synthesis of findings to generate a set of statements that represent that aggregation, through assembling the findings (Level 1 findings) rated according to their quality, and categorizing these findings on the basis of similarity in meaning (Level 2 findings). These categories will then be subjected to a meta-synthesis in order to produce a single comprehensive set of synthesized findings (Level 3 findings) that can be used as a basis for evidence-based practice. Where textual pooling is not possible the findings will be presented in narrative form. The synthesis of the review will be guided by a conceptual framework (Appendix II).

Conflicts of interest

None to declare

Acknowledgements

The authors would like to acknowledge funding from the Canadian Institutes of Health Research for the Queen's Joanna Briggs Collaboration. This review is being conducted in support of a four province Canadian Institutes of Health Research - Partnerships for Health System Improvement (CIHR PHSI) study titled: Safety in Homecare: Focus on Medication Management lead by Ariella Lang and Marilyn Macdonald.
References


[26] Accreditation Canada, the Canadian Institute for Health Information, the Canadian Institute for Patient Safety, the Institute for Safe Medication Practices Canada. Medication Reconciliation in Canada: Raising The Bar - Progress to date and the course ahead. Ottawa Ontario: Accreditation Canada; 2012.


Appendix I: Data extraction instruments

QARI data extraction instrument

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**Study Description**

Methodology

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Method

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Phenomena of interest

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Setting

---

Geographical

---

Cultural

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Participants

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Data analysis

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Authors Conclusions

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Comments

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Complete Yes [ ] No [ ]
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Extraction of findings complete  Yes ☐ No ☐
MAStARI data extraction instrument

**JBI Data Extraction Form for Experimental / Observational Studies**

Reviewer ______________________ Date ______________________

Author ______________________ Year ______________________

Journal ______________________ Record Number ______________________

**Study Method**

- RCT □
- Quasi-RCT □
- Longitudinal □
- Retrospective □
- Observational □
- Other □

**Participants**

Setting

Population

**Sample size**

Group A ________________ Group B ________________

**Interventions**

Intervention A

Intervention B

Authors Conclusions:

________________________________________________________________

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**Reviewers Conclusions:**

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**Study results**

**Dichotomous data**

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**Continuous data**

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Appendix II – Conceptual Framework

Homecare safety – medication management study

Caregiver: Formal & informal
- 65 yrs + medication management receiving homecare services

Strategies

Family Caregiver role/burden

Errors/ adverse events

Issues

adherence

Polypharmacy: medication administration

Individual
Healthcare professional
Family
Environment
Medication
Disease complications
Organizational

Numeracy
Literacy
Health literacy
Finances
Environment
Health status
Cognitive status
Functional status
Quality of life

Sept 11
2012

Reminders
Technology
Education
Support systems