General Introduction
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Scope of the thesis
The present thesis aims to provide insight into drug related problems (DRP). DRP are a frequently occurring situation in older people, who are using different medications for more than one chronic disease. It is a burden for the patient and may lead to unnecessary hospital admissions and potentially live threatening situations. In the introduction, DRP in older patients using multiple drugs for the treatment of chronic diseases, and their determinants are discussed. In addition, the use of medication reviews and other interventions to identify and resolve DRP are addressed. Finally, the objectives and the outline of the thesis are presented.

Definitions of DRP
DRP are events or circumstances involving drug treatment that actually or potentially interfere with desired health outcomes (PCNE). DRP include contra-indications, interactions, side effects, and inefficacy of treatment. DRP are often the result of specific pharmacological effects of drugs or relate to metabolic changes as occurring in older people. Older people often have a reduced liver and/or kidney function. In conjunction with a reduced capacity of various other physiological functions including cognitive impairment, chronic morbidity and a poor nutritional status these conditions make this age group highly sensitive to effects of drugs. This is particularly the case when several drugs are to be used simultaneously (polypharmacy) as the result of comorbidity. On the other hand, DRP may be caused by prescription errors (inappropriate drug selection, incorrect dosage) and non-adherence with treatment.

How serious is the problem?
In 1999 the American Institute of Medicine (IOM) published a report called “to err is human: building a safer health system” and showed that about 44,000 to 98,000 patients die in hospitals each year as a result of medical errors that could have been prevented in the US. Regardless of their origin, DRP are an important cause of morbidity and substantially increase the risk of hospitalisation. As the result of medication errors in the Netherlands, each year about 19,000 patients were found to have a preventable hospital admission of which 1,250 patients might die and others experience lasting health damage.

What are the risk factors for DRP?
Polypharmacy, non-adherence to treatment, hospitalisation and discharge from hospital have been associated with the occurrence of DRP of older patients.
General Introduction

Polypharmacy
The use of medication in patients over 65 years and older is three times higher than average and even five times higher in patients who are over 75 years of age. Moreover, five out of six patients of 65 years and older use at least one medication per day for the treatment of a chronic disease and 50% use at least three different drugs. In the case of older patients, the number of drugs used is strongly associated with the risk of DRP. The number of drugs also correlates with adverse drug reactions (ADR) rates. Systematic reviews on the effect of polypharmacy on health outcomes of older patients indicate that multiple drug use is a strong predictor of hospitalisation, nursing home replacement, death, hypoglycaemia, fractures, impaired mobility, pneumonia and malnutrition.

Polypharmacy has been defined in many different ways and the appropriate definition may differ according to patient, population and setting. However, as in the present thesis, in many studies and guidelines polypharmacy is defined by the use of five or more drugs for the treatment of one or more chronic diseases.

Non-adherence
With respect to long-term therapy, adherence is defined by the World Health Organization (WHO) as ‘the extent to which a persons’ behaviour, taking medication, following a diet and executing lifestyle changes corresponds with agreed recommendations from the health care worker’. A distinction can be made between intentional and unintentional non-adherence. Unintentional non-adherence can be seen as unplanned behaviour, such as patients who forget to take their medication. Intentional behaviour refers to an active process in which a patient decides not to use the medication as prescribed. In this case, the patient weighs the pros and cons of using or not using one or more medicines against each other.

Another important form of non-adherence is that patients stop taking their medicines for a period of time after an initial period of adherence. A survey in the Netherlands showed that 50-70% of patients discontinues the use of chronic medication within one year after initiation. Experienced or expected side-effects (e.g. on the basis of information from the patient leaflet or internet), perceived ineffectiveness of treatment, personal considerations related to the use of certain drugs, and an apparent lack of urgency are the main reasons for discontinuing chronic drug therapy. Assuming that drugs have been prescribed correctly, non-adherence may substantially affect the effectiveness of treatment, enhance the risk of side effects and increase morbidity as well as mortality. Indeed, side effects were found to be the underlying cause of a substantial proportion of hospitalisations as the result of non-adherence to drug use. In the present thesis, patients are considered non-adherent if they do not take their medication as recommended by the prescribing physician.
Hospitalisation and discharge
Hospital admissions of older people are often caused by DRP, but they are also a major cause of DRP themselves. DRP occurring as the result of hospitalisation and subsequent discharge have been associated with a wide variety of prescription errors including those attributable to incorrect medication histories of patients or adherence to the hospital drug formulary or physicians’ preference for another drug of the same therapeutic group, multiple (un-) intentional additions and changes in medication regimens, discontinuity of care, inadequate patient education and deficits in the communication and/or transfer of information at discharge.\(^5\;28-30\)

Interventions aimed at reducing the occurrence of DRP after hospital discharge
The high prevalence of DRP in older patients discharged from hospital has increased awareness of healthcare workers and decision makers to improve the pharmaceutical care for this category of patients. Several interventions aimed at reducing the occurrence of DRP, including medication reconciliation, discharge planning and counselling by home visits and telephone calls have been investigated.\(^5\;31-34\)

Over the years, several checklists and protocols have been developed to help physicians to select the most effective and safest medication for older patients. Of these, the US Beers’ criteria\(^{16}\;35\) and the European STOPP/START criteria\(^{36}\) as well as many adaptations thereof, have been most widely used.\(^23\) In addition, dose packaging and drug distribution systems can be implemented to reduce the risk of inappropriate medication use and incorrect dosing.\(^37\)

However, instead of applying separate interventions indiscriminately, a comprehensive and individualized pharmaceutical care plan may be necessary to prevent or identify and resolve DRP in this group of vulnerable patients. The intervention should include a practicable and structured method to identify DRP after hospital discharge and increase the knowledge of patients about their medicines with respect to purpose and use in order to improve adherence.\(^38\;39\)

Medication review is an intervention that can be used to identify possible DRP which has been shown to reduce the occurrence of DRP.\(^40-45\) Several levels of medication review have been described by the British task force on Medicine Partnership as shown in figure 1.\(^39\) In our study, a level three-medication review, the clinical medication review, has been applied. At this level the medication used by the patient is reviewed in the context of the condition of the patient and the way how patients organize the use of medication in their lives. This means listening to the views and beliefs of individual patients about their medicines, understanding their medicine taking behaviour and taking full account of their preferences in decisions about their treatment.\(^39\) Conducting this type of medication review requires a good collaboration between general practitioner (GP) and pharmacist. Unfortunately, only limited data on the effectiveness of interventions including all components of the clinical medication review are available.\(^40\;41\;44\)
In this thesis we have developed a tool for a clinical medication review that can be used by community pharmacists and other health care professionals to identify possible DRP of older patients using multiple drugs and recently discharged from hospital. This tool includes a checklist listing DRP frequently occurring in older patients with chronic diseases and a semi-structured interview script to identify DRP experienced by the patient after hospital discharge. This semi-structured questionnaire is highly relevant, because problems such as no knowledge of drug use, side effects, fear of side effects, which may occur frequently in this specific patient group, are also identified.

Figure 2 Levels of Medication Review
Bron: Room for review; Task Force on Medicines Partnership and the National Collaborative Medicines Management Services Programme 2002

Objective of the thesis
More information is needed on how comprehensive pharmaceutical care provided by community pharmacists can result in a reduction of DRP in older patients with polypharmacy discharged from the hospital. The main objective was to study the effects of a clinical medication review by community pharmacists on the occurrence of DRP in older patients with polypharmacy discharged from hospital. For this purpose the main objective was divided into different subobjectives, which are described in the following chapters.
Outline of the thesis

Chapter 2 focuses on the prevalence and the nature of specific DRP in older patients with a chronic disease and polypharmacy discharged from hospital. For this purpose a medication review tool based on two elements was developed: a checklist listing DRP commonly associated with medication used by elderly people with a chronic disease and a structured-interview script to identify DRP experienced by the patient and their underlying causes.

Chapter 3 provides a description of the design of a randomized controlled intervention study (RCIS) in which a medication review tool is evaluated and its effect compared with that of usual pharmaceutical care in older patients with polypharmacy after hospital discharge.

Chapter 4 describes the effect of a clinical medication review by community pharmacists, which consist of medication analysis, treatment analysis and patient counselling. In the RCIS the effect on the occurrence of DRP is investigated by comparing an intervention and control group. This study shows the beneficial effects of the use of a clinical medication review by community pharmacists on the occurrence of DRP in older patients with polypharmacy discharged from hospital.

Chapter 5 is a more detailed description of the method and results presented in chapter 4.

Chapter 6 describes the development of a practicable, structured and comprehensive tool for pharmacists and GP to conduct clinical medication reviews, including the patient’s perspective and a list of common potentially DRP in older patients with polypharmacy.

Chapter 7 describes the results of the RCIS with respect to adherence, beliefs about medication and satisfaction with information about medication of older patients with polypharmacy discharged from hospital.

Chapter 8 investigates the effect of CMR on health care utilization and to investigate whether CMR is a cost effective method to reduce DRPs in patients using a combination of drugs for the treatment of chronic disorders who are discharged from hospital.

The final chapter 9 presents the main findings of the thesis, followed by a discussion of the methodological considerations of the various studies. The implementation of the clinical medication review method in practice according to the RE-AIM model is discussed, followed by final conclusions.
Reference List


Ref Type: Report


