Targeted and Tailored Pharmacist-led Medication Reviews
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CHAPTER 5

Barriers and enablers of older patients to deprescribing of cardiometabolic medication: A focus group study

Stijn Crutzen, Gert Baas, Jamila Abou, Tessa van den Born-Bondt, Jacqueline G Hugtenburg, Marcel L Bouvy, Mette Heringa, Katja Taxis and Petra Denig.

CHAPTER 5

Abstract

Background
Deprescribing has been recommended for managing polypharmacy but deprescribing preventive medication in older patients is still uncommon. We aimed to investigate older patients’ barriers to and enablers of deprescribing cardiometabolic medication.

Methods
Two focus groups were conducted among patients ≥70 years with polypharmacy, including cardiometabolic medication. Purposive sampling through four community pharmacies was used in two regions in the Netherlands. A topic list was developed using literature and the theoretical domains framework (TDF). The meetings were audio recorded, transcribed verbatim and coded using thematic coding, attribute coding and the TDF. In addition, patients were categorised on attitudes towards medication and willingness to stop.

Results
The meetings were attended by 17 patients and one caregiver (71 to 84 years). In total 15 barriers and 13 enablers were identified within four themes, partly related to beliefs, fears and experiences regarding using or stopping medication, and partly related to the relationship with the health care professional and the conditions to stop. Some patients attributed their wellbeing to their medication and were therefore unwilling to stop. Reducing cardiometabolic medication because of less strict treatment targets confused some patients and was a barrier to deprescribing. Having options to monitor clinical measurements and restart medication were enablers. Patients were only willing to stop cardiometabolic medication when this was proposed by a health care professional they trusted. Patients with a positive attitude towards medication varied in their willingness to stop cardiometabolic medication. Patients with a negative attitude towards medication were generally willing to stop medication but still perceived several barriers and may consider some medication as being essential.

Conclusion
Fears, beliefs, and experiences regarding using and stopping medication as well as trust in the HCP influence willingness to have medication deprescribed. Attitudes towards medication in general do not necessarily translate into willingness or unwillingness to stop specific medication. For deprescribing cardiometabolic medication, patient involvement when setting new treatment targets and monitoring the effects on short-term outcomes are important.
Barriers and enablers of older patients to deprescribing of cardiometabolic medication

Introduction

Intensive glucose and blood pressure lowering treatment can prevent long-term complications in people with diabetes and/or hypertension but it may come with an increased risk of harm. Whether in older patients intensive glycemic and blood pressure control is more beneficial than harmful has been a matter of debate. While some investigators argued that intensive treatment should be maintained in older patients because of shown benefits in clinical trials, others reasoned that the limitations of these trials resulted in overestimating benefits and underestimating harms, particularly for older patients. In addition, it has been stated that in people with a reduced life expectancy the benefits of preventive cardiometabolic medication become less relevant. Given these considerations, it has been recommended to consider deprescribing such medication in older or frail people with diabetes and/or hypertension. Deprescribing is the process of stopping or reducing of medication by a health care professional (HCP) in consultation with the patient, with the goal of managing polypharmacy and improving patient outcomes. Despite initiatives in various countries to support healthcare providers to deprescribe medication in older patients, it seems that deprescribing of glucose-lowering and antihypertensive medication is uncommon. It might be that patients have not been sufficiently involved in this process.

Previous qualitative research identified multiple barriers to deprescribing in primary care. One of the barriers expressed by general practitioners (GPs) is the unwillingness of patients or their relatives to discontinue medication. GPs believe that patients may be resistant towards deprescribing and they fear that patients feel given up on when medication is stopped. This perceived unwillingness is in contrast with results from survey studies in which a large proportion of patients stated that they were willing to stop one or more medications when advised to do so by their physician. Enablers of deprescribing for patients are a general dislike of medication, the feeling that the medication is not needed anymore and fear of side effects and interactions. Patients are more willing to stop when they trust their physician, when it is conducted as a test and monitoring is offered. An important barrier for patients is the belief that the medication is still needed or that they may have benefits in the future.

Research on patients’ barriers to and enablers of deprescribing in both older and younger populations has mainly been focused on medication in general or on symptomatic medication that can be considered inappropriate to take for an extended period of time, such as benzodiazepines, antidepressants and proton pomp inhibitors. Patients’ barriers to deprescribing and their willingness to stop medication may be different for preventive cardiometabolic medication. One study among relatively young patients showed that there were several medication specific beliefs and experiences towards deprescribing of cardiovascular...
medication. Whether this is also the case in older people has not been explored so far. The aim of the present study was to investigate older patients' barriers to and enablers of deprescribing cardiometabolic medication.

**Methods**

**Design and setting**

Two focus groups were performed to identify barriers to and enablers of deprescribing cardiometabolic medication among older patients with polypharmacy. The focus groups were held in November 2018 in a community pharmacy and in a primary health care centre in different regions of The Netherlands. The focus groups were moderated by JH (PharmD, PhD) and MH (PharmD, PhD), both are female senior researchers with a broad interest in optimizing pharmacotherapy and pharmacy-based interventions. Both researchers have experience with moderating focus groups and received interview training in the past. There was no prior relationship with the focus group participants. The focus groups were attended by the participants and the moderator and two junior researchers (GB and SC). Demographic information was collected using a short questionnaire. Caregivers were asked to fill in the information about their care receiver. Patients were asked to bring a list of their medication to facilitate discussion about specific medication. All procedures performed in this study involving human participants were in accordance with the ethical standards of the Medical Ethic Commission of VU Medical Center (FWA00017598) and with the 1964 Helsinki declaration and its later amendments.

**Participants and recruitment**

Purposive sampling was used, where participants were recruited through four community pharmacies, situated in an urban area, of which two were in a large city and two were in a large town. Eligible patients were identified from the community pharmacy information systems. This was done to ensure that the participants used the medication of interest, were managed by different HCPs and came from different settings. In total 120 eligible patients received an invitation letter. Known caregivers for eligible patients were invited directly and patients were informed in the invitation letter that they could send their caregiver to the focus group. Patients could contact their community pharmacy or one of the researcher by phone or email when they wanted to participate. Patients who did not respond to the letter within 1 week were called to ask whether they were willing to participate until sufficient patients agreed to participate. The aim was to invite 10 participants per focus group with the expectation that between 7-10 would actually be able to participate. Informed consent was collected from the patients and caregivers who attended the focus groups. Participants were compensated for their time with a twenty euro gift card.
Inclusion criteria
(based on the community pharmacy information system)

- **Older patients:** At least 70 years of age
- **Polypharmacy:** Use of 5 or more different medications at Anatomical Therapeutic Chemical (ATC) level 5\(^3\), where chronic was defined as 3 or more dispensings in the past year, of which at least 1 in the last 6 months
- All of the patients were part of one or both subgroup and at least 2 patients from each subgroup per focus group were included:
  - **Subgroup cardiovascular without diabetes:** at least 2 unique cardiovascular medications (ATC code C) dispensed between 1 July and 31 October 2017 and between 1 July and 31 October 2018, without any dispensing for diabetes medication (ATC A10) in 1 July and 31 October 2018
  - **Subgroup type 2 diabetes:** at least 1 non-insulin diabetes medication (ATC code A10B) dispensed in July-October 2017 and between 1 July and 31 October 2018

Exclusion criteria (according to the assessment of the patients’ community pharmacist)

- **Too frail/ill:** Patient was too frail/ill to be approached and no caregiver was known
- **Unwilling to participate in research:** Patient and/or caregiver did not wish to be approached for research
- **Non-Dutch speaking:** Patient and/or caregiver did not speak Dutch

Topic list
A topic list was developed using existing literature on barriers to and enablers of deprescribing\(^31,32,34-36,38-40\) and the theoretical domains framework (TDF)\(^41,42\). The TDF describes important factors underlying behavioural change and implementation issues. This framework can be helpful in identifying behavioural domains that are relevant for patients in relation to the implementation of deprescribing and their willingness to stop medication. It includes the following domains: knowledge, skills, social/professional identity, beliefs about capabilities, beliefs about consequences, motivation and goals, memory attention and decision processes, environmental context and resources, social influences, emotion, behavioural regulation and nature of the behaviours. The topic list was piloted separately by the 2 moderators. As a result, the introduction of the topic list and the wording of some questions were changed. A translated version of the topic list can be found in “online appendix 1”. After a short introduction on the topic, the participants were asked to introduce themselves and to elaborate on the medication they were taking. Next, the participants were asked about their experiences with stopping
medication, their opinion about stopping medication and their considerations for wanting to continue or stop specific medication. Also, they were asked under which conditions and under whose supervision they would be willing to stop medication. Finally, they were given the opportunity to raise other issues they felt were relevant that had not yet been addressed.

Analyses
The focus groups were audio recorded and transcribed verbatim. Field notes were used to enhance the transcripts with non-verbal information. ATLAS.ti version 5.2.18 was used for the analysis. Directed content analysis was conducted in order to identify barriers and enablers to deprescribing. Two researchers (SC and TB) developed a coding scheme prior to coding the focus groups (online appendix 2). The following levels of coding were used: 1) thematic codes coding barriers and enablers to deprescribing, 2) the twelve domains of the TDF, 3) attribute codes for descriptive information about what was stated. Attribute codes were added as needed in an iterative process. This coding scheme was discussed with PD and KT. Quotes were coded by SC and TB separately, and consensus was reached by discussing disagreements in coding. The coded transcripts were analysed in 2 ways.

1. Quotes coded as barriers to or enablers of deprescribing were sorted, summarized and reduced by 2 researchers (SC, GB). The quotes were sorted per domain from the TDF, subdivided in barriers and enablers. Afterwards, overarching themes were identified within the barriers and enablers. Consensus was reached by discussing disagreement, remaining disagreement was discussed with a third researcher (PD). Example quotes were selected for the manuscript.

2. Barrier and enablers were extracted per patient and a summary of these barriers and enablers was made per patient (online appendix 3). Patients were then categorized according to their attitudes towards medication (positive, negative, indifferent) and their willingness to stop medication (resistant, willing, indifferent), based partly on the typology of Weir et al.39. This categorisation was conducted by SC and PD independently, and consensus was reached by discussing disagreements.

Quotes were translated from Dutch to English for this article by SC and the translations were checked by PD and KT. No feedback from the participants was collected. The Consolidated Criteria for Reporting Qualitative Research (COREQ) was used to ensure completeness of reporting43.
Barriers and enablers of older patients to deprescribing of cardiometabolic medication

Results

Characteristics of participants

In total 17 patients and 1 caregiver out of the 120 invited by mail participated in the focus groups. Reasons for not wanting to participate were: not interested to participate, illness, patient felt that he/she could not contribute anything relevant, and/or other obligations. The age of the patients ranged from 71 to 84 years. Most patients took medication for cardiovascular disease and half of them for type 2 diabetes (Table 1). In total 15 barriers and 13 enablers were identified within 4 major themes (Table 2), including ‘Opinions and beliefs about medication’ and ‘Opinions and beliefs about stopping medication’, ‘Relationship with the health care professional’ and ‘Conditions to stop’. Barriers and/or enablers were identified for 7 out of the 12 domains of the TDF (Table 2).

Table 1. Characteristics of the patients

<table>
<thead>
<tr>
<th></th>
<th>Focus group 1</th>
<th>Focus group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>Large city</td>
<td>Large town</td>
</tr>
<tr>
<td>Number of participants</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Male patients</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Age of patients (median, range), years</td>
<td>78 (74-82)</td>
<td>77.5 (71-84)</td>
</tr>
<tr>
<td>Patients with type 2 diabetes</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Patients with cardiovascular disease</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Patients with 5-10 medications*</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Patients with &gt;10 medications*</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

The demographic information of the care receiver was used for this table

* For one participant the number of medications was missing
Theme 1 and 2: Opinions and beliefs about medication and stopping medication

Patients’ opinions about their medication strongly influenced their willingness to stop medication. There were some patients who attributed their wellbeing to their medication and were therefore in general unwilling to stop (B2). In many cases patients talked about medication in general terms. They were content with their overall health (B9), so they did not see a reason to change any medication.

FG1, P6 (B9): “I have had them for years, and I have no complaints. The other day they mentioned it [stopping medication] again, this diabetes sugar person [specialised nurse practitioner who provides diabetes care for this patient]. She said: “shall we adjust the medication”, I said: I wouldn’t do it”

Some patients were more explicit about the necessity of specific medication, referring to the severity of the underlying disease and the consequences of stopping that medication (B1).

FG2, P5 (B1): “I have been taking blood thinners for years. When you have had a TIA (transient ischemic attack) and you would stop with the blood thinners, then you run the risk of it happening again. So you will not stop, no”.

One participant came to the opposite conclusion. This participant expressed that he/she was doing well and was therefore willing to stop medication (E8).

Several patients had a negative opinion about their medication, often because of side effects. Experiencing side effects was a reason for wanting to stop medication (E6), in particular related to statins. Also, fear of developing side effects was a reason for wanting to stop (E2). This was expressed both in general and more specific terms. Some participants mentioned fear of specific side effects of particular medication, whereas others sometimes regarded medication as “poison” or not good for your health (E1) or were afraid to become dependent on their medications (E7).

FG1, P2 (E1): “Well, I think that if you are taking medication for too long, that this is not good for your body”.

Some patients wanted to take less medication in general (E5). Having to take a large amount of medication was seen as burden (E4). Confusion about clinical measurements like blood pressure, glucose and cholesterol, and conflicting treatment targets mentioned by HCPs could lead to resistance to stop medication (B4).

FG1, P4 (B4): “Well, my husband has been using metformin for years. At a certain point he lost some weight, and what do you know, she [specialised nurse practitioner] said it’s not needed anymore. So I started to think, how high is the sugar allowed to go? Right,
cause somehow I didn't really trust it. And then he [GP] said: “well, it's fine as long as the sugar doesn't go above 8. Below 8, and it's all fine”. How is that possible, 6 years, 6 years ago they said it is not allowed to be above 5. (...) Then you do not understand, that suddenly it can go away. That you do not have to use it anymore”.

Some patients did not seem to understand why a statin was needed, particularly when the statin was prescribed for primary prevention. Low cholesterol levels led to opposing views among patients. Several patients wondered why they took statins when their cholesterol was already low (E3), whereas another patient did not see a reason to stop since the statin was successfully lowering the cholesterol (B3). Uncertainty and fear about what would happen when medication is stopped or previous bad experiences with stopping were mentioned as reasons for not wanting to stop (B6,B7,B8). In contrast, other patients referred to good experiences with stopping (E9).

**Theme 3 and 4: Relationship with health care professional and conditions to stop**

In general, patients were only willing to stop cardiometabolic medication when this was proposed by a HCP they trusted. When this was proposed by another than their prescribing HCP they would be less willing to stop, for example, when a GP would propose to stop treatment that was prescribed by their specialist (B11). On the other hand, even patients with a positive opinion about their medication may be willing to stop medication when their physician would propose to do so (E10). Important for having trust in the HCP was the perception that the HCP was knowledgeable about the medication and the underlying disease. Most often the trusted HCP was a prescribing specialist or GP. In general, patients were negative about initiation of deprescribing by a nurse practitioner or a community pharmacist (B14,B15). Then again, patients who stated that they had received a medication review in the past led by a community pharmacist were more positive about an advisory role of the pharmacist (E11).

**FG2,P10 (E10):** [What if a physician would propose to stop medication?] “Well, he [physician] knows more about it [medication] than me, so I would trust him, if later on you don't trust it you can always come back to it”

Some participants stated that they lacked knowledge to decide about stopping medication. This lack of knowledge was relevant for patients with a negative opinion about their medication and wanting to stop medication, as well as for patients with a more positive opinion about their medication. For patients with a negative opinion about their medication, a lack of knowledge was seen as a barrier to stop medication (B10). So even if they were willing to stop, they felt it was only possible when their physician endorsed it.
FG1, P2 (B10): “Of course you can argue with your doctor but because he has learned for it, I think you will always end up with the short end of the stick”

Patients also felt that their physician sometimes lacked time (B12), and did not always take their complaints serious (B13), both of which hindered having a conversation about stopping medication. Participants were more comfortable to stop medication when stopping was considered a test (E13) and when this process was monitored using, for example, clinical measurements (E12).

FG2, P1 (E12): “That they take your experiences after stopping into account and if possible do some blood tests or I don’t know, whatever they can measure.”
### Table 2. Barriers and enablers subdivided in four themes

<table>
<thead>
<tr>
<th><strong>Barriers theme 1: Opinions and beliefs about medication</strong></th>
<th><strong>TDF domain</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B1:</strong> Medication is seen as essential because of knowledge or beliefs about the underlying disease</td>
<td><strong>Knowledge/ Beliefs about consequences</strong></td>
</tr>
<tr>
<td><strong>B2:</strong> Belief that he/she is doing well, because of the medication</td>
<td><strong>Beliefs about consequences</strong></td>
</tr>
<tr>
<td><strong>B3:</strong> Belief that statin is needed because cholesterol is successfully lowered</td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td><strong>B4:</strong> Confusion about treatment targets for glucose and cholesterol</td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td><strong>B5:</strong> It is hard to distinguish between the effects of different medications</td>
<td><strong>Knowledge</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Enablers theme 1: Opinions and beliefs about medication</strong></th>
<th><strong>TDF domain</strong></th>
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<tbody>
<tr>
<td><strong>E1:</strong> Belief that medication is bad for long term health</td>
<td><strong>Beliefs about consequences</strong></td>
</tr>
<tr>
<td><strong>E2:</strong> Fear/belief that medication can cause severe side effects</td>
<td><strong>Emotion/ Beliefs about consequences</strong></td>
</tr>
<tr>
<td><strong>E3:</strong> It is unclear why statins are needed when cholesterol has always been low</td>
<td><strong>Knowledge</strong></td>
</tr>
<tr>
<td><strong>E4:</strong> Taking a lot of medication is a burden</td>
<td><strong>Motivation and goals</strong></td>
</tr>
<tr>
<td><strong>E5:</strong> Would like to take fewer medications in general</td>
<td><strong>Motivation and goals</strong></td>
</tr>
<tr>
<td><strong>E6:</strong> Experienced side effects</td>
<td><strong>Nature of behaviour</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Barriers theme 2: Opinions and beliefs about stopping medication</strong></th>
<th><strong>TDF domain</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B6:</strong> Belief that it can be dangerous to stop medication</td>
<td><strong>Beliefs about consequences</strong></td>
</tr>
<tr>
<td><strong>B7:</strong> Fear about what will happen when you stop medication</td>
<td><strong>Emotion</strong></td>
</tr>
<tr>
<td><strong>B8:</strong> Bad experiences with stopping medication</td>
<td><strong>Nature of behaviour</strong></td>
</tr>
<tr>
<td><strong>B9:</strong> Unwilling to change medication when satisfied with their current health status</td>
<td><strong>Nature of behaviour</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Enablers: Theme 2: Opinions and beliefs about stopping medication</strong></th>
<th><strong>TDF domain</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>E7:</strong> Belief that it is good to change medication to prevent becoming dependent</td>
<td><strong>Beliefs about consequences</strong></td>
</tr>
<tr>
<td><strong>E8:</strong> Feeling good, therefore willing to stop medication</td>
<td><strong>Motivation and goals</strong></td>
</tr>
<tr>
<td><strong>E9:</strong> Good experiences with stopping medication</td>
<td><strong>Nature of behaviour</strong></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th><strong>Barriers theme 3: Relationship with the health care professional</strong></th>
<th><strong>TDF domain</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B10:</strong> Dependence on the physician to stop medication, since the patient lacks the knowledge to make such decisions</td>
<td><strong>Knowledge/ Beliefs about capabilities</strong></td>
</tr>
<tr>
<td><strong>B11:</strong> Distrust other HCP than his/her prescribing physician to change medication</td>
<td><strong>Emotion</strong></td>
</tr>
<tr>
<td><strong>B12:</strong> The prescribing physician does not have the time to discuss stopping medication</td>
<td><strong>Environmental context and resources</strong></td>
</tr>
<tr>
<td><strong>B13:</strong> The prescribing physician does not take medication related complaints seriously</td>
<td><strong>-</strong></td>
</tr>
<tr>
<td><strong>B14:</strong> Distrusts the nurse practitioner to change medication</td>
<td><strong>Emotion</strong></td>
</tr>
<tr>
<td>B15: Distrusts the community pharmacist to change medication</td>
<td>Emotion</td>
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<td>-----------------------------------------------------------</td>
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</tr>
<tr>
<td><strong>Enablers theme 3: Relationship with the health care professional</strong></td>
<td>TDF domain</td>
</tr>
<tr>
<td><strong>E10:</strong> Willingness to stop medication when their physician proposes to do so, since the physician knows more about medication</td>
<td>Knowledge/ Beliefs about capabilities</td>
</tr>
<tr>
<td><strong>E11:</strong> Positive attitude towards community pharmacist giving advice on which medication might be stopped during a medication review</td>
<td>Knowledge</td>
</tr>
<tr>
<td><strong>Enablers theme 4: Condition to stop</strong></td>
<td>TDF domain</td>
</tr>
<tr>
<td><strong>E12:</strong> Clinical measurements are used to monitor after medication has been stopped</td>
<td>-</td>
</tr>
<tr>
<td><strong>E13:</strong> Stopping medication is considered a test/Medication can be restarted</td>
<td>-</td>
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</table>

TDF= Theoretical domains framework

**Patient typology**

Four typologies were identified based on the participants’ attitudes towards medication and their willingness to stop medication. The first 2 types had a positive opinion about their medication, but differed in willingness to stop medication (Figure 1). People belonging to the third type had a more negative opinion about their medication and were willing to stop medication but still considered some medication essential. The fourth type was largely indifferent towards their medication and towards stopping medication.
### Figure 1. Patients’ typology based on attitudes towards medication and willingness to stop medication.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive opinion about medication and unwilling to stop (n=5)</strong></td>
<td>These patients attributed their wellbeing to their use of medication and were therefore unwilling to stop medication. Some members of this group had bad experiences in the past with stopping medication, while others feared what would happen when medication would be stopped.</td>
</tr>
<tr>
<td><strong>Positive opinion about medication but willing to stop (n=3)</strong></td>
<td>These patients were content with their current health status and had a positive opinion about their medication. However, they would like to take less medication or at least not more medication in general. They were willing to stop medication when this was proposed by their physician.</td>
</tr>
<tr>
<td><strong>Negative/ambivalent opinion about medication and willing to stop (n=8)</strong></td>
<td>These patients had a more negative opinion about their medication and were willing to stop medication. However, they still considered some of their medications essential and experienced some barriers to stop medication. They felt they were dependent on their physician to stop medication because they lacked knowledge themselves, and in some cases their physician lacked time or did not take their complaints seriously.</td>
</tr>
<tr>
<td><strong>Indifferent towards medication and stopping (n=2)</strong></td>
<td>These patients had no explicit opinion about their medication. They were not really interested in what happened with their medication and tended to leave decisions about their medication to their physician or family members.</td>
</tr>
</tbody>
</table>


CHAPTER 5

Discussion

Summary
Views about medication and about deprescribing strongly varied between and within patients. Fears, beliefs, and experiences regarding using or stopping medication influenced the willingness to have medication deprescribed. A good health status was for some patients a reason to consider stopping and for others a reason not wanting to stop medication. Some patients perceived cardiovascular or diabetes medication as essential to reach their treatment targets or prevent serious events. In other cases, patients perceived less need for medication, particularly for statins. Potential and existing side effects contributed to a negative view on medication and enhanced the willingness to stop certain medication. Patients were more willing to stop medication when this was proposed by a HCP they trusted, which was often the prescribing physician. Although many patients felt they lacked necessary knowledge about their medication, were unfamiliar with deprescribing and considered it as something they would undergo, most of them would like to be involved in the process of deprescribing. Monitoring and the option to restart were considered important conditions for deprescribing. Four general typologies were identified based on the participants’ views about medication and willingness to stop, that is, (1) positive attitude towards their medication and resistant towards stopping; (2) positive attitude towards medication but willing to stop; (3) negative attitude towards medication and willing to stop, and (4) indifferent towards both their medication and stopping of medication.

Comparison with existing literature

Treatment targets and short-term outcomes
By focusing on preventive cardiometabolic medication, we identified both barriers and enablers to deprescribing that were specifically related to treatment targets and short-term outcomes. It seems that patients focus more on short-term than on long-term outcomes of preventive treatment. This has also been observed in a recent interview study on treatment adherence conducted in the United States of America (USA), where almost half of the patients expected only short-term benefits (e.g. low blood pressure or glucose levels) of their hypertension and diabetes medication. Previous qualitative research among younger Dutch patients identified well-controlled blood pressure as an enabler to deprescribing of antihypertensive medication. An interview study on medication-related concerns among type 2 diabetes (T2D) patients in the USA showed that the continued need for medication when treatment targets were reached may confuse patients. Our study showed that having low cholesterol was a reason for wanting to stop medication for some patients but for others low cholesterol was seen as evidence of the efficacy of the treatment, making them reluctant to stop.
Patient involvement
Involving patients in achieving targets when initiating or intensifying treatment may be a barrier for deprescribing cardiometabolic medication at a later stage. Medication can be seen as essential for achieving targets. This notion is supported by an interview study conducted in the USA showing that medication that improved test results is seen as more important by patients, especially when these test results are discussed with the patient. In the Netherlands, T2D patients receive quarterly and yearly check-ups, in which HbA1c, blood pressure and cholesterol are tested and discussed with the patient. Patients with a long history of diabetes have received years of instruction during these check-ups on the importance of achieving treatment targets by adhering to medication. Re-evaluating these treatment targets, by personalising targets based on age and diabetes duration has shown to improve cardiometabolic control. Our study showed that such relaxation of treatment targets can cause confusion for some patients and may lead to reluctance towards stopping medication.

Follow up
The importance of follow up for patients has been emphasised in previous qualitative research. The use of clinical measurements, such as blood pressure or glucose levels, during follow up is a necessary condition for many patients to evaluate the outcome of deprescribing cardiometabolic medication. In addition, closely monitoring clinical outcomes can help in safely tapering off cardiometabolic medication ensuring deprescribing will not jeopardise disease management. This may require additional explanation to patients, since slight increases in these outcomes can be expected and are wanted.

Deprescribing typology
When looking at the willingness to stop medication and attitudes towards medication at individual patient level, different ‘deprescribing’ typologies emerge. Previous Australian qualitative research in older people identified three types of patients when it comes to willingness to have any medication deprescribed, which were characterized as ‘attached to medication’, ‘would consider deprescribing’ and ‘defers to others’. In our study a more nuanced picture was observed. Regarding the first group with a positive attitude towards their medication, who were classified by Weir et al. as being resistant towards deprescribing, we found that only part of these participants were resistant to deprescribing. Several of them were willing to stop when this was proposed by their physician, emphasizing the influence of the patients’ relationship with their HCP on willingness to undergo deprescribing. For the second group, with a more negative attitude towards their medication it was confirmed that they were indeed willing to stop some medication in general but not always willing to stop with certain medication. Furthermore, while these
patients were linked by Weir et al. to being more knowledgeable and preferring an active role in decision making\textsuperscript{39}, this preference for shared decision making was not seen for all patients in our study. Some of them explicitly mentioned having a lack of knowledge and wanting their physician to guide the decision. Although they want their opinions and preferences to be taken into account, they do not necessarily want to make the decision about stopping medication or they belief they are unable to do so. Our study illustrates that a general negative attitude towards medication does not always translate to all medication and that positive attitudes towards medication do not always translate to unwillingness to stop medication. Many factors can contribute to the perceived importance of a certain medication, including perceived benefits and harms, but also a long history of use and trust in the prescribing physician\textsuperscript{46}. Differences in perceived importance between medications within a patient may partly explain the contrasting findings in survey studies that on the one hand patients are satisfied with their current treatment and on the other hand state that they are willing to stop one or more medications when this is proposed by their physician\textsuperscript{30–33}. These possible differences in willingness to stop different medication groups both within and between patients should be explored further.

Theoretical domains framework

The use of the TDF allowed us to describe barriers or enablers to deprescribing from the patients’ perspective in more detail compared to previous studies. Guided by the TDF, we distinguished the subtle but relevant difference between a ‘belief that something bad will happen’ and ‘fear that something bad may happen’, where previous papers reported only fear of what would happen when medication is deprescribed as a barrier\textsuperscript{34}. For some domains of the TDF, no clear barriers or enablers were identified. This may be due to the fact that TDF was developed to assess or describe factors that influence behavioural change\textsuperscript{42}, whereas patients did not think of themselves as the main actor in the process of deprescribing. Most patients considered their HCP to be responsible and thus considered deprescribing as something they would undergo. Therefore, it is not surprising that no barriers or enablers were mentioned by the participants in the domains ‘skills’, ‘memory attention and decision processes’ and ‘behavioural regulation’. When deprescribing becomes more common in practice and patients may become more active in this decision-making process additional barriers or enablers might be identified in these domains.

Strengths and limitations

Two focus groups were conducted including a sample of 17 older adults and 1 caregiver, which were exposed to different HCPs and came from different settings. Caregivers can have a different perspective on medication use and deprescribing than patients themselves. By including a caregiver we strived to include this
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Perspective in our study, but including only one caregiver might not be enough for this purpose. Recruitment of patients was done in two urban areas in the Netherlands, whereas attitudes towards deprescribing might be different in more rural areas or other countries. The exclusion of non-Dutch speaking patients limits the representativeness for minority groups in the Netherlands. Also, selection bias may have been introduced by inviting patient for a focus group about stopping medication, since this may attract relatively well informed patients with a strong opinion on their medication. The results, however, indicate that also patients without strong opinions were included. Most participants had limited experience with deprescribing and eligibility for deprescribing was not assessed. As a consequence some of the questions and topics discussed were hypothetical in nature.

Implications for research and practice
This study expands on the knowledge on attitudes towards deprescribing and willingness to stop medication in older patients. At a patient level, we identified four typologies, namely positive towards medication and unwilling to stop, positive towards medication but willing to stop suggested under certain conditions, negative towards medication and willing to stop certain but not all medication, and indifferent towards medication and stopping. Depending on this typology, HCPs might adapt their strategy to inform patients about the relevance of deprescribing and involve them in the process. Further research is needed to confirm this typology in other settings, and to develop and evaluate tailored strategies for different patient groups. Furthermore, this study provides new insights in the attitudes and willingness to stop cardiometabolic medication. The willingness to stop medication depends on which medication is discussed. Whether or not a patient would be willing to stop certain medication can be based on incorrect interpretation of information by the patient, for example, with regard to treatment targets and the relevance of short-term outcomes. These findings are relevant when developing strategies to support the implementation of deprescribing cardiometabolic medication. Further research is needed on how willingness to stop medication is affected by patients’ expectation about the effects and continuous need of cardiometabolic medication on short- and long term health and by the way HCPs communicate about these expectations.

For HCPs who want to deprescribe medication, it is important to take the patient’s beliefs into account. Each patient comes with a set of different beliefs about their health and medication. These beliefs result in a set of unique barriers to and enablers of deprescribing and need to be identified and addressed as part of the deprescribing process. Importantly, within one patient, concerns and perceived necessity can differ between medications. A negative opinion on medication in general and willingness to reduce the number of medications does not necessarily imply that this patient is willing to stop the medication the HCP thinks is most appropriate to deprescribe. Aligning the assessment of the HCP with
the beliefs of the patient is therefore essential. Identifying and addressing beliefs about medication of patients with limited medical knowledge can be a difficult task. To address these incomplete or incorrect beliefs about stopping medication, the use of benefit-risk communication tools similar to those that have been developed for prescribing decisions\textsuperscript{50} may be helpful. Beliefs about risks can be based on incorrect interpretation of information and are prone to confirmation bias. For the development of a deprescribing benefit-risk communication tool, making use of the mental model approach, which has been successfully applied in several non-pharmaceutical settings, could be helpful\textsuperscript{51}. The mental model states that individuals construct a script about risks they perceive\textsuperscript{52}. This script is then used to estimate personal risk and adapt behaviour accordingly. In the mental model approach both correct and incorrect notions and beliefs about a certain risk in the target population are identified. Providing information that takes these initial beliefs and fears into account can help individuals to make better informed decisions.

When deprescribing cardiometabolic medication, it is important to acknowledge the role that treatment targets play in the process of initiating, continuing and/or intensifying medication treatment. Reducing HbA1c, blood pressure and cholesterol have been key treatment goals for patients with T2D and cardiovascular disease and may often be related to the need of being adherent to medication\textsuperscript{53–55}. When strict control is no longer expected to be beneficial or when it can even be considered harmful, new goals need to be set that are more fitting for the current situation. Involving patients in this process can support medication changes and reduce drug-related problems, as was shown in a study using goal attainment scaling during community pharmacist-led medication reviews\textsuperscript{56}. In the future, HCPs might address this better also when initiating treatment, making it more clear that treatment targets should be personalised and adapted to the benefits and risks for the individual patient. Furthermore, monitoring the outcomes of deprescribing and explaining that slight increases in risk factor levels may be wanted can help the acceptance of deprescribing cardiometabolic medication. Also, having the option to restart when the outcomes are not as expected or wanted can be important for patients. Finally, when deprescribing is proposed by another HCP than the prescribing physician, clearly communicating to the patient that the prescribing physician will be consulted before a final decision is made can be important to establish trust.
Conclusion

Patients' barriers to and enablers of deprescribing cardiometabolic medication are in part similar to deprescribing of other medication groups and of younger patients. Four general typologies were identified regarding the patients' willingness to stop medication but within one patient the willingness or resistance to deprescribing can be linked to specific medication. It is thus important to explore the patients' attitudes in general and in relation to specific medication before proposing to deprescribe medication. Regarding cardiometabolic medication, the concept of personalised treatment targets needs to be explained so that it is clear that benefits and risks of such medication change when people get older. To monitor and evaluate the effects of reducing the medication assessing clinical measurements is helpful when patients understand that higher treatment targets are wanted. Our findings illustrate the complexity of decision making and the need for involving patients early in the process of deprescribing.

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Author Contributions Statement

SC, GB, JA, TB, JH, MB, MH, KT and PD: research idea and study design: SC, GB, JH and MH: Data acquisition; SC, GB, TB, and PD: analysis and interpretation; KT, MH, MB, JH and PD: supervision or mentorship. All authors contributed substantially to the intellectual content during manuscript drafting or revision. All authors approved the manuscript and this submission.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.
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