Received: 16 October 2018 | Revised: 19 December 2018 | Accepted: 26 December 2018

DOI: 10.1111/bcp.13861

SYSTEMATIC REVIEW AND META-ANALYSIS

# Health care professionals' attitudes towards deprescribing in older patients with limited life expectancy: A systematic review

Carina Lundby[1,2] | Trine Graabæk[1,2] | Jesper Ryg[3,4] | Jens Søndergaard[5] | Anton Pottegård[1,2] | Dorthe Susanne Nielsen[6,7,8]

[1] Hospital Pharmacy Funen, Odense University Hospital, Odense C, Denmark

[2] Clinical Pharmacology and Pharmacy, Department of Public Health, University of Southern Denmark, Odense C, Denmark

[3] Department of Geriatric Medicine, Odense University Hospital, Odense C, Denmark

[4] Geriatric Research Unit, Department of Clinical Research, University of Southern Denmark, Odense C, Denmark

[5] Research Unit of General Practice, Department of Public Health, University of Southern Denmark, Odense C, Denmark

[6] Migrant Health Clinic, Odense University Hospital, Odense C, Denmark

[7] Centre for Global Health, University of Southern Denmark, Odense C, Denmark

[8] Health Sciences Research Center, University College Lillebælt, Odense M, Denmark

**Correspondence**
Carina Lundby, Hospital Pharmacy Funen, Odense University Hospital, Solfaldsvej 38, Entrance 208, DK-5000 Odense C, Denmark.
Email: carina.lundby.olesen@rsyd.dk

**Funding information**
VELUX FONDEN, Grant/Award Number: 00018248

**Aims:** The aim of this systematic review was to explore health care professionals' attitudes towards deprescribing in older people with limited life expectancy.

**Methods:** A systematic literature search was conducted from inception to December 2017 using MEDLINE, EMBASE and CINAHL. Studies were included if they specifically concerned older people (≥65 years) with limited life expectancy, including those residing in any type of aged care facility, or were based on representative patient profiles. Results were analyzed inspired by the Joanna Briggs Institute's method for synthesis of qualitative data. Studies were characterized using a checklist for reporting of qualitative research.

**Results:** Eight studies were included. Six studies explored health care professionals' views on deprescribing in general, and two studies focused specifically on psychotropic agents. All eight studies explored the views of physicians, mostly general practitioners, while three studies also considered other health care professionals. Four themes related to health care professionals' attitudes towards deprescribing were identified: (i) patient and relative involvement; (ii) the importance of teamwork; (iii) health care professionals' self-assurance and skills; and (iv) the impact of organizational factors. Within each of these themes, 3–4 subthemes were identified and analysed.

**Conclusions:** Our results suggest that health care professionals' decisions to engage in deprescribing activities with older people with limited life expectancy depend on multiple factors which are highly interdependent. Consequently, there is an urgent need for more research on how to approach deprescribing in clinical practice within this population.

KEYWORDS

drug safety, elderly, prescribing

## 1 | INTRODUCTION

Polypharmacy is highly prevalent among older people.[1,2] Although many older people may benefit from the use of multiple medications, they are also more susceptible to the potential adverse effects of medications and drug–drug interactions compared with younger people.[3,4] Thus, certain medications are best discontinued or avoided in this population.[5]

  

There is a substantial lack of evidence for the benefits of many common medications among older people,[6] as these are often excluded from pivotal clinical trials.[7] Further, treatment guidelines rarely consider multimorbidity, which is highly prevalent among older people,[4,8,9] leading to uncertainty regarding the benefits of treatment. Frail older people may also have a limited life expectancy which might be shorter than the known "time to benefit" for some drugs.[10,11] Finally, the goals of drug treatment in older people may change compared with those in other drug users—that is, shift from reducing the risk of disease and prolonging life to reducing the burden of treatment and maintaining quality of life.[6] As such, the proven benefits of some medications may no longer be consistent with the goals of care for this particular population.

Deprescribing is the planned, supervised dose reduction or stopping of a medication.[12,13] For the reasons outlined above, deprescribing may be particularly relevant in older people with limited life expectancy. Although deprescribing has gained increased attention in recent years,[13] barriers to deprescribing have been described among health care professionals (HCPs).[14-16] In order to develop interventions aimed at reducing inappropriate prescribing, gaining insight into such barriers is vital. Recent reviews have summarized HCPs' attitudes towards deprescribing in adults[17] and older people[18]; however, these have not specifically addressed deprescribing in older people with limited life expectancy.

With this systematic review, we aimed to explore HCPs' attitudes towards deprescribing in older people with limited life expectancy.

### What is already known about this subject

- Deprescribing of medications may be particularly relevant in older people with limited life expectancy, in whom many medications can no longer be expected to provide clinical benefit.
- In order to develop interventions aimed at reducing inappropriate prescribing, more insight into what may hinder health care professionals from engaging in deprescribing activities specifically within this population is needed.

### What this study adds

- Health care professionals' decisions to engage in deprescribing activities with older people with limited life expectancy seem to depend on multiple interdependent factors.
- These factors are related to patients and relatives, health care professionals' joined teamwork, health care professionals' self-assurance, and organizational factors.
- Research on how to approach deprescribing in clinical practice within this population is needed.

## 2 | METHODS

This systematic review was conducted guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement[19] as well as the ENhancing Transparency in REporting the synthesis of Qualitative research (ENTREQ) statement.[20] The review was registered in PROSPERO (CRD42018083819).

### 2.1 | Search strategy

Assisted by a research librarian, the following electronic databases were searched from inception to December 2017: MEDLINE (via Ovid SP), EMBASE (via Ovid SP) and CINAHL. The searches were conducted combining keywords for "Population" (older people with limited life expectancy) and "Intervention" (deprescribing) according to the Population, Intervention, Comparison, and Outcome (PICO) model. Only the blocks "Population" and "Intervention" were searched, as the blocks "Comparison" and "Outcome" cannot be directly applied to qualitative research.[21] Further, a broad search strategy was used, as the searches were also used to identify papers for two other systematic reviews on this topic. The searches were restricted by filters for conference abstracts. In addition to the identification of original literature, reference lists of relevant reviews were also scrutinized to identify potentially eligible studies. The full search strategy is outlined in Appendix A.

### 2.2 | Inclusion and exclusion criteria

Studies were included if they: (i) described original research; (ii) were published in English; and (iii) qualitatively explored HCPs' attitudes towards deprescribing in older people, aged 65 years or more, with limited life expectancy. Studies could describe attitudes towards deprescribing through any type of deprescribing intervention, as well as for all types of medication. Further, in the absence of a clear definition of when older people can be expected to be in the last years of their life, it was initially decided to include studies concerning older people residing in any type of aged care facility, eg a residential care or nursing home. Alternatively, studies had to be based on representative patient profiles, with information on eg age, health status, medical history, diagnoses and medications, from which the patients could be expected to have a limited life expectancy. Studies based on patient profiles were discussed in the full author group—ie the eligibility of these studies was decided with input from a geriatrician, a general practitioner and clinical pharmacologist, a nurse, and three clinical pharmacists, all with considerable clinical experience.

Studies were excluded if they: (i) explored HCPs' attitudes towards deprescribing through surveys/questionnaires or quantitative interviews; (ii) did not concern older people with limited life expectancy (according to the criteria outlined above); (iii) concerned people <65 years of age (median); or (iv) concerned terminally ill people (in their last weeks of life).

## 2.3 | Selection, extraction and analysis

Two authors (C.L. and T.G.) independently screened all titles and abstracts for potentially eligible studies, using Covidence as screening tool.[22] Disagreements were resolved through consensus. Full-text articles were obtained for all studies that appeared to be eligible or where eligibility could not be adequately judged based on the title or abstract. Afterwards, the two authors independently screened all full-text articles for eligibility. Disagreements were resolved through consensus. Finally, all authors went through every study deemed to be potentially eligible by the initial assessors, to decide on ultimate inclusion or exclusion. A team-based approach was used to reach agreement throughout the screening process, as well as on the ultimate inclusion or exclusion of each study.

Two authors (C.L. and T.G.) independently extracted the following information from the included studies: study details, aim, medication, participants, patients, methods, analysis and main findings (ie HCPs' attitudes towards deprescribing). Disagreements on content were resolved through consensus. Results were analyzed inspired by the Joanna Briggs Institute's method for synthesis of qualitative data in systematic reviews.[23] The synthesis was carried out in a three-step process. First, the two authors independently extracted all findings from the results sections in the included studies. Findings from each study were organized into tables and accompanied by supporting quotations. Disagreements on findings were resolved through consensus. Next, the two authors collaboratively developed categories based on at least two findings with sufficient similarity. Findings could describe similar concepts and/or different aspects of a concept. Finally, one author (C.L.) synthesized all findings within each category. The synthesized findings were discussed among three authors (C.L., T.G. and D.N.) to decide on the final content. Again, a team-based approach was used to reach agreement throughout the extraction and analysis.

## 2.4 | Assessment of reporting

Two authors (C.L. and T.G.) independently assessed the reporting of all included studies, using the COnsolidated criteria for REporting Qualitative research (COREQ), a 32-item checklist developed to promote explicit and comprehensive reporting of qualitative studies.[24] Disagreements on reporting were resolved through consensus among three authors (C.L., T.G. and D.N.). Again, a team-based approach was

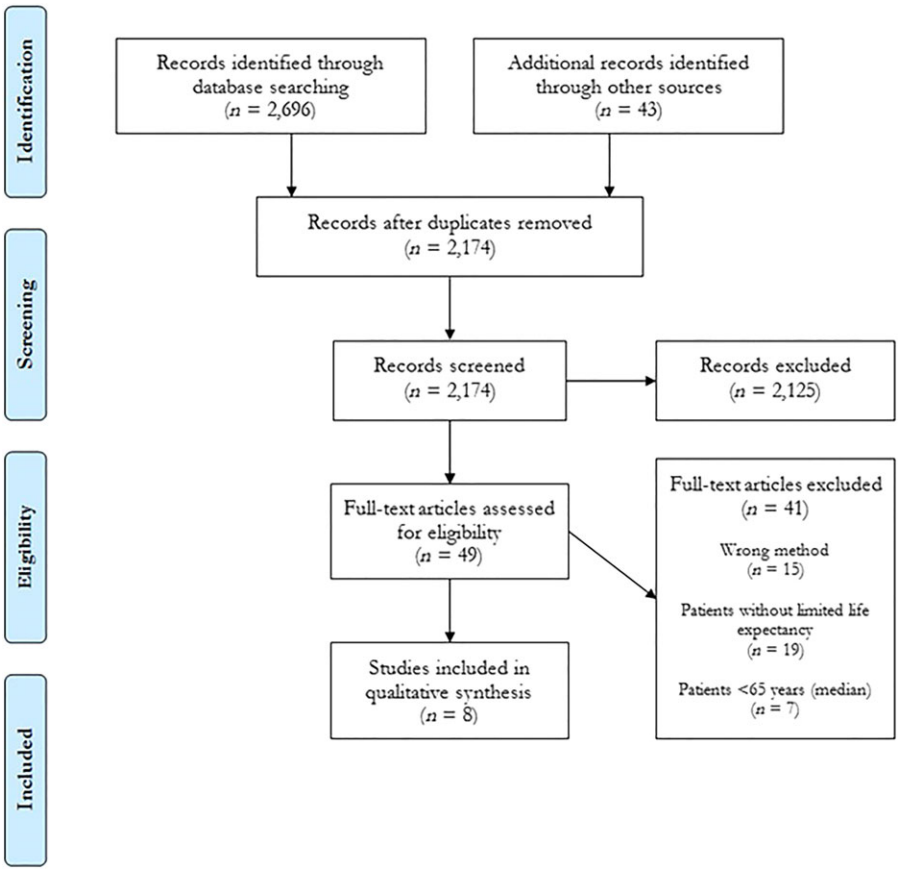


**FIGURE 1** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram[19]

used to reach agreement. Studies were not excluded on the basis of the assessment; rather, it was used to transparently highlight how the authors reported their findings.

## 3 | RESULTS

### 3.1 | Study selection

A flowchart of the study selection process is presented in Figure 1. The literature search yielded a total of 2,739 references, leaving 2,174 after removal of duplicates. During the screening process, 2,125 references were excluded on the basis of title and abstract. Of the remaining 49 references, 41 were excluded following the full-text assessment. To ensure transparency, a brief summary of these 41 studies, including the reason for their exclusion, is provided in Appendix B. Ultimately, eight studies were included in this review.[25-32]

### 3.2 | Study characteristics and main findings

The characteristics and main findings of the included studies are presented in Table 1. HCPs' attitudes towards deprescribing in older patients with limited life expectancy were explored through either individual interviews[25-28] or focus group interviews,[29-32] with one study conducting telephone interviews as well.[31] All but one study concerned older people residing in some type of aged care facility—ie a rest home,[25] residential care,[26] advanced care facility,[27] nursing home,[28,29] residential aged care facility[30] or long-term care facility.[31] Patient profiles were used to facilitate deprescribing discussions in three studies.[25,30,32] While six studies concerned the use of multiple medications, two studies focused specifically on the use of hypnotics[28] and antidepressants.[29] All studies explored the views of physicians, mostly general practitioners (GPs),[25-27,31,32] while three studies also explored the views of pharmacists,[30,31] nurses[29] and long-term care facility staff.[31] Further, all but one study concerned HCPs working within primary care, either in general practice and/or some type of aged care facility. For the remaining study, it was not specified whether the included HCPs were affiliated to primary and/or secondary care.[30] Although two of the studies were not purely qualitative,[27,30] only data concerning the qualitative parts of these studies are presented in this review.

The results presented in two of the included papers originate from the same study—ie they represent the views of the same participants.[25,26] Further, the results presented in one of the papers[27] originate from two separate studies[31,36] and compare factors influencing deprescribing in advanced care facilities in two different countries. Since one of these studies is already included in this review based on the literature search,[31] only data originating from the other study is presented in this review.[36] Finally, the investigators of one of the studies also served as the participants in the study.[30]

### 3.3 | Assessment of reporting

The completeness of reporting in the included studies is presented in Table 2. The reporting varied across the studies, with a median of 21 (range 13–31) out of the 32 items in COREQ being reported. The lowest and highest rates of reporting were observed within the first domain (median of 3 [range 1–6] out of 8 items) and third domain (median of 8 [range 3–8] out of 9 items), respectively. The first domain concerns reporting of the research team and the authors' possible relationships with the study participants, whereas the third domain concerns reporting of the data analysis and how the authors have presented their findings.[24]

The reporting in two of the studies is carried out according to COREQ, with the checklist being included in both papers.[25,26] Although seven of the eight studies state the methodological orientation that have been used, three of these studies do not support this with any references.[25,28,30]

### 3.4 | HCPs' attitudes towards deprescribing in older people with limited life expectancy

The analysis elicited four themes related to HCPs' attitudes towards deprescribing in older people with limited life expectancy: (i) patient and relative involvement; (ii) the importance of teamwork; (iii) HCPs' self-assurance and skills; and (iv) the impact of organizational factors. These themes are presented in Table 3.

#### 3.4.1 | Theme 1 Patient and relative involvement

GPs consider deprescribing as being an important component in providing good "end of life" care.[27] However, deprescribing in patients with limited life expectancy may be hindered by the patients themselves, as well as their relatives.[25-28,30-32] Three subthemes emerged within this theme: (i) involvement; (ii) characteristics; and (iii) pressure and requests (Table 3).

When considering deprescribing, physicians want to involve patients and relatives in treatment decisions[26,28,32] and provide necessary information on possible treatment choices and outcomes.[26,32] However, physicians and pharmacists experience that patient involvement within this particular population may be compromised by patient characteristics such as cognitive impairment[28,30,32] as well as patients being insistent on continuing their regular medical treatment.[26,32] Further, deprescribing may be hindered by some physicians finding it difficult to address "end of life" discussions.[32] Finally, physicians sometimes experience pressure, both from patients[25,28] and relatives,[27,28,31] to continue prescribing certain medications. Some physicians report giving in on these types of request, simply to avoid conflict.[28]

#### 3.4.2 | Theme 2 The importance of teamwork

Many HCPs are frequently involved in the treatment of older people with limited life expectancy.[31,32] However, the teamwork between

**TABLE 1** Characteristics of the eight included studies as presented in the individual papers

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Analysis | Main findings |
|---|---|---|---|---|---|---|---|
| Ailabouni, 2016, New Zealand[a,25] | To use a hypothetical patient profile to reveal GPs' insights on deprescribing in an individual with multimorbidity | Multiple medications | 10 GPs; 2–32 years of experience with prescribing in residential care<br><br>1 GP declined to comment on the patient profile | Older multimorbid patient (one hypothetical patient profile) | Face-to-face semi-structured interviews; discussions based on one hypothetical patient profile; GPs requested to comment on which medicines they would review, reduce, discontinue or change | Content analysis | Responses to each medicine in the hypothetical patient profile varied. Opinions on deprescribing preventive and symptomatic medicines varied a great deal. Conflicting opinions existed, particularly around the prescription of statins, dipyridamole and bisphosphonates. Dilemmas around the appropriate clinical management of reflux disease and insomnia in older people also came to light |
| Ailabouni, 2016, New Zealand[a,26] | To ascertain challenges and enablers for deprescribing by examining the views of GPs about deprescribing for older people in a residential care setting | Multiple medications | 10 GPs (7 male); 2–32 years of experience with prescribing for older people in residential care | Older people in residential care | Face-to-face semi-structured interviews; discussions based on interview guide | Content analysis; analysis assisted by a TDF developed by Michie et al (2005)[33] | Four themes were identified to define the issues around prescribing for older people, from the GPs' perspectives. Theme 1, the "recognition of the problem", discusses the difficulties involved in prescribing for older people. Theme 2 outlines the identified behaviour change factors relevant to the problem. Deprescribing challenges were drawn from these factors and summarized in Theme 3 under three major headings: "prescribing factors", "social influences" and "policy and processes". Deprescribing enablers, based on the opinions and professional experience of GPs, |

(Continues)

**TABLE 1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Analysis | Main findings |
|---|---|---|---|---|---|---|---|
| | | | | | | | were retrieved and summarized in Theme 4 |
| Bolmsjö, 2016, Sweden[b,27] | To: (i) compare and contrast behavioural factors influencing the deprescribing practices of GPs providing care for ACF residents in two separate countries; (ii) review health policy and ACF systems in each setting for their potential impact on the prescribing of medications for an older person in residential care; and (iii) based on these findings, provide recommendations for future ACF deprescribing initiatives[c] | Multiple medications | 12 GPs (3 male); working in primary health care for 2–38 years; having weekly visits in ACFs | Residents in ACFs | Individual semi-structured interviews; discussions based on interview guide | Content immersion; findings coded and systematically collapsed under each of the key constructs of the IMBP (Fishbein et al, 2006)[34] | It was identified that deprescribing by GPs in ACFs is a complex process, and that there are numerous barriers to medication reduction for aged care residents in both countries, both with similarities and differences. The factors affecting deprescribing behaviour were identified and divided into: intentions, skills and abilities, and environmental factors |
| Flick, 2012, Germany[28] | To explore: (i) what makes doctors prescribe hypnotics for older people; (ii) what physicians expect and how they evaluate the relevance of hypnotics in the context of everyday treatment of old people in long-term care settings; and (iii) how physicians evaluate the risk associated with hypnotic medication | Hypnotics | 20 NH physicians (9 male); aged 36–68 years; specialized in internal medicine ($n$ = 9), general practice ($n$ = 7), family medicine ($n$ = 3), and psychiatry ($n$ = 1) | Older multimorbid NH residents with sleep disorders | Episodic interviews; discussions based on interview schedule | Thematic coding and comparative categorization | Three interpretative patterns concerning the use of drugs for treating sleep disorders were identified – "by request", "ambivalence" and "reflected prescription". Differences between them were determined by the significance of residents' wishes, neglect of risks, particularly that of addiction, and the attempt to balance benefits and disadvantages |
| Iden, 2011, Norway[29] | To examine decision-making among doctors and nurses in NHs on the treatment | Antidepressants | 16 doctors (5 male) working either part time or full time in NHs, and 8 registered | NH patients with depression using antidepressants | Focus group interviews; discussions based on interview guide | Systematic text condensation in accordance with Malterud (1993)[35] | The interviews elicited three main themes. The first theme was the diagnostic process. The |

(Continues)

**TABLE 1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Analysis | Main findings |
|---|---|---|---|---|---|---|---|
| | of patients with depression using antidepressants | | nurses (1 male); aged 30–70 years; 1–40 years of clinical experience | | | | informants expressed difficulty in differentiating between depression and sorrow resulting from loss in old age. Further, the doctors reported that they relied on nurses' observations and rarely carried out systematic diagnostic work and follow-up of patients with depression. The second theme was treatment. Antidepressants were usually the only type of treatment provided, and patients were kept on medication, even though staff felt uncertain whether this was effective. The third theme was who really determines the treatment. Registered nurses reported that unskilled and auxiliary nursing staff requested drug treatment, and doctors felt some pressure from the nurses to prescribe antidepressants |
| Page, 2016, Australia[30] | To: (i) determine agreement between physicians and pharmacists with respect to medicines to deprescribe when using the simplified GPGP tool; and (ii) define reasons for any observed differences between physicians and pharmacists on | Multiple medications | 2 physicians and 2 pharmacists[e] | Frail older people in RACFs (multiple patient cases; a randomized controlled deprescribing trial) | Semi-structured focus group interview; discussion based on multiple patient cases | Content analysis | The themes that emerged from the data were grouped into three domains: patient-centred care, clinical reasoning and challenges to deprescribing. Physicians and pharmacists had a common rationale and shared many concerns, and had similar clinical |

(Continues)

**TABLE 1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Analysis | Main findings |
|---|---|---|---|---|---|---|---|
| | medicines selected for deprescribing using qualitative analysis[d] | | | | | | reasoning. However, pharmacists favoured certainty and confidence, whereas physicians were more comfortable with ambiguity |
| Palagyi, 2016, Australia[31] | To report perceptions of medication use and the concept of deprescribing for LTCF residents, as identified by the RELEASE study[f] | Multiple medications | 8 GPs; aged 43–73 years; 20–42 years of experience as GPs<br><br>19 LTCF staff members; aged 21–69 years; working in aged care for 1–20 years<br><br>2 dispensing pharmacists and 2 accredited medication review pharmacists | Frail older people in LTCFs | Focus group interviews with GPs and LTCF staff members; discussions based on discussion guides unique to each participant group<br><br>Semi-structured telephone interviews with pharmacists; discussions based on interview guide | Single coding framework; the IMBP (Fishbein et al, 2006)[34] used a theoretical framework | GPs preferred "the path of least resistance", signalling systems barriers (poor uniformity of LTCF medical records, limited trained LTCF personnel), time constraints (resident consultations, follow-up with specialists and family) and the organization of care (collaborating with LTCF staff, pharmacists and prescribing specialists) as obstacles to deprescribing |
| Schuling, 2012, The Netherlands[32] | To explore how experienced GPs feel about deprescribing medication in older patients with multimorbidity and the extent to which they involve patients in these decisions | Multiple medications | 29 GPs (27 male); aged 39–65 years; at least 5 years of experience as GPs | Very old patients with multimorbidity | Focus group interviews; discussions guided by a hypothetical patient profile | Not stated | GPs discern symptomatic medication and preventive medication; deprescribing the latter category is seen as more difficult by the GPs due to lack of benefit/risk information for these patients. Factors influencing GPs' deprescribing were beliefs concerning patients (patients have no problem with polypharmacy; patients may interpret a proposal to stop preventive medication as a sign of having been given up on; and confronting the patient with a discussion of life |

(Continues)

**TABLE 1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Analysis | Main findings |
|---|---|---|---|---|---|---|---|
| | | | | | | | expectancy *vs* quality of life is "not done"), guidelines for treatment (GPs feel compelled to prescribe by the present guidelines) and organization of healthcare (collaboration with prescribing medical specialists and dispensing pharmacists) |

[a]The results presented in these two papers originate from the same study—ie they represent the same 10 GPs. The first paper[25] presents the results from the discussions based on the comment on the hypothetical patient profile, whereas the second paper[26] presents the results from the discussions based on the interview guide. Both papers mention the other as a follow-up study.

[b]The results presented in this paper originate from two separate studies[31,36] and compares factors influencing deprescribing in advanced care facilities in two different countries. As one of these studies is already included in this review, based on the literature search,[31] only data originating from the other study are presented.[36] Only data concerning the qualitative part of this study are presented in this review. Parts of the descriptive data ("Participants" and "Methods") have been retrieved from the original study.[36]

[c]Aim of original study: To illustrate GPs' experiences of the work with older people living in nursing homes in Sweden, to get input on how older people's care can be improved, and to identify obstacles to high-quality care.[36]

[d]Only data concerning the qualitative part of the study are presented in this review.

[e]The four participants in the focus group interview are also the investigators of the study.

[f]This study encompasses interviews with residents, relatives and health care professionals. Only data concerning the interviews with the health care professionals are presented in this review.

ACF, advanced care facility; GP, general practitioner; GPGP, good palliative–geriatric practice; HCP, health care professional; IMBP, integrative model of behaviour prediction; LTCF, long-term care facility; NH, nursing home; RACF, residential aged care facility; RELEASE, depRescribing: A nEw affordable health care modeL for the prEscribing and Administration of medicationS for vulnerable older people in agEd care homes; TDF, theoretical domains framework.

**TABLE 2** Completeness of reporting of the eight included studies, according to COREQ[24]

| Reporting criteria | Number of studies reporting criterion | References of studies reporting criterion |
|---|---|---|
| Domain 1: Research team and reflexivity | | |
| Personal characteristics | | |
| Interviewer/facilitator | 6 | 25,[a] 26,[a] 27,[b] 29, 31, 32 |
| Credentials | 5 | 25, 26, 27, 29, 30 |
| Occupation | 5 | 25, 26, 27, 29, 30 |
| Gender | 2 | 25, 26 |
| Experience and training | 4 | 25, 26, 29, 31 |
| Relationship with participants | | |
| Relationship established | 2 | 25, 26 |
| Participant knowledge of interviewer | 2 | 25, 26 |
| Interviewer characteristics | 1 | 29 |
| Domain 2: Study design | | |
| Theoretical framework | | |
| Methodological orientation and theory | 7 | 25,[c] 26, 27, 28,[c] 29, 30,[c] 31 |
| Participant selection | | |
| Sampling | 7 | 25, 26, 27, 28, 29, 31, 32 |
| Method of approach | 6 | 25, 26, 27, 28, 29, 31 |
| Sample size | 8 | 25, 26, 27, 28, 29, 30, 31, 32 |
| Nonparticipation | 2 | 25, 26 |
| Setting | | |
| Setting of data collection | 5 | 25, 26, 27, 31, 32 |
| Presence of nonparticipants | 2 | 25, 26 |
| Description of sample | 8 | 25, 26, 27, 28, 29, 30, 31, 32 |
| Data collection | | |
| Interview guide | 7 | 25, 26, 27, 28, 29, 31, 32 |
| Repeat interviews | 3 | 25, 26, 27 |
| Audio/visual recording | 8 | 25, 26, 27, 28, 29, 30, 31, 32 |
| Field notes | 5 | 25, 26, 27, 29, 31 |
| Duration | 8 | 25, 26, 27, 28, 29, 30, 31, 32 |
| Data saturation | 5 | 25, 26, 27, 31, 32 |
| Transcripts returned | 3 | 25, 26, 31 |
| Domain 3: Analysis and findings | | |
| Data analysis | | |
| Number of data coders | 7 | 25, 26, 27, 29, 30, 31, 32 |
| Description of coding tree | 8 | 25, 26, 27, 28, 29, 30, 31, 32 |
| Derivation of themes | 8 | 25, 26, 27, 28, 29, 30, 31, 32 |
| Software | 4 | 25, 26, 30, 31 |
| Participant checking | 3 | 25, 26, 31 |
| Reporting | | |
| Quotations presented | 8 | 25, 26, 27, 28, 29, 30, 31, 32 |
| Data and findings consistent | 8 | 25, 26, 27, 28, 29, 30, 31, 32 |
| Clarity of major themes | 8 | 25, 26, 27, 28, 29, 30, 31, 32 |
| Clarity of minor themes | 5 | 25, 26, 27, 31, 32 |

[a]The reporting in these two studies is carried out according to COREQ. Both papers include this checklist.

[b]The results presented in this paper originate from two separate studies[31,36] and compare factors influencing deprescribing in advanced care facilities in two different countries. As one of these studies is already included in this review, based on the literature search,[31] only data originating from the other study are presented.[36] Parts of the reporting are retrieved from the original study.[36]

[c]The methodological orientation used in these three studies is not supported by any references.

COREQ, COnsolidated criteria for REporting Qualitative research.

**TABLE 3** Identified themes related to HCPs' attitudes towards deprescribing in older people with limited life expectancy

| | |
|---|---|
| Patient and relative involvement | |
| Involvement | Physicians and pharmacists find it important to consider quality of life, life expectancy and patients' general well-being when considering deprescribing in patients with limited life expectancy,[25-28,30] and consequently want to include patients and/or relatives in decisions on medical treatment and treatment options.[26,28,32] Whereas some GPs report these types of talk to have a positive effect on the relationship with their patients, others find it difficult to talk about life expectancy and quality of life, and also consider it unethical.[32] Physicians may include relatives in medical decisions if the decisions are considered to be important,[26] if they concern treatment of multimorbid patients[26] or if the patients are not able to understand medical suggestions owing to cognitive impairment[28] |
| Characteristics | GPs find that certain patient characteristics, such as low levels of education, old age and cognitive impairment, contribute to making it difficult for patients to understand medical issues.[28,30,32] Further, GPs find it challenging to convince some patients to change or stop their medications, either because the patients simply resist, as they have been taking their medications for a long time,[26] or seemingly have no problem with polypharmacy and medication burden.[32] GPs believe that they may not always be fully aware of patients' medication-related problems as the patients under-report adverse drug events or report them to other HCPs[32] |
| Pressure and requests | Physicians sometimes feel pressure from patients[25,28] and relatives[27,28,31] to prescribe and/or continue prescribing certain medications—eg sleeping medication.[28] Mentioned reasons for this are relatives wanting to improve patients' health state[27] or having strong expectations of the ability of specific medications to keep family members alive.[31] Further, GPs believe that some patients and relatives have unrealistic views on the role and importance of medications for older persons,[27] as well as, on the part of the relatives, the stage of life of residents in LTCF care.[31] Whereas some physicians try to explain the risks associated with a certain medical treatment when feeling pressure from patients or relatives, others keep prescribing the requested medication, to avoid conflict.[28] |
| The importance of teamwork | |
| Interprofessional relationships | GPs value the involvement of pharmacists in multidisciplinary teams.[26,27,32] However, they sometimes question the relevance of the recommendations that pharmacists make and mention this as not being recognized by the pharmacists.[26] Further, some GPs feel frustrated with the constant flow of information from LTCFs, making them more reluctant to engage in further collaboration with LTCF staff.[31] Conversely, other physicians working in NHs tend to select specific nurses and rely on their observations, meaning that they rarely carry out reviews of patients' health status and medical treatment.[29] GPs generally feel a lack of acceptance of their decisions by other HCPs.[26] GPs seek forums for meeting other GPs to discuss deprescribing in older people.[27]<br>Nurses believe that they spend a lot of time dealing with unskilled nursing staff.[29] Nurses experience a lack of interest from physicians in discussing their observations,[29] while nursing staff also question GPs' motivation to initiate changes to patients' medical treatment[31] |
| Specialists | Many GPs are cautious about changing or discontinuing medications initiated by specialists.[25,26] Before making any medical changes, some GPs prefer to consult a specialist, especially when considering deprescribing of disease-specific medications.[27] However, some GPs find cooperation with prescribing medical specialists, who tend to advocate their personal treatment guidelines, particularly challenging.[32] GPs are more willing to deprescribe when a specialist no longer sees a patient.[25] GPs believe that patients perceive specialists as being more experienced and skilled[26] |
| Pressure and requests | Physicians in aged care facilities often feel pressure from nursing staff to prescribe certain medications.[25-29] One of the main reasons for this is nursing staff wanting to keep patients calm due to busyness, eg by prescribing of antidepressants[29] or medications with a sedative effect.[25,26,28] Whereas some physicians simply reject prescribing medications at the request of nursing staff, others tend to meet these requests, to avoid conflict.[28] Nurses also report receiving requests from unskilled and auxiliary nursing staff to treat patients with certain medications—eg antidepressants[29] |
| HCPs' self-assurance and skills | |
| Responsibility and concerns | Pharmacists and LTCF staff consider GPs as those responsible for deprescribing among residents in LTCFs.[31] GPs believe that deprescribing takes as much clinical responsibility as initiating treatment[26]; however, some physicians deviate from taking responsibility for patients' medical treatment.[28,31] Some physicians hesitate to deprescribe as they fear that patients will experience a deterioration in their health status,[26,29] and consequently prefer to "maintain status quo".[26] GPs are also afraid that patients, relatives and other HCPs may interpret coincidental deterioration as being a direct outcome of deprescribing.[26] Further, physicians are concerned that patients may interpret deprescribing as a sign of being given up on[26,32] or their illness not being taken seriously.[28] Finally, some physicians fear that patients may get the impression that deprescribing means that they will lose contact with their HCPs[28] |
| Confidence and self-image | Whereas some GPs express confidence in deprescribing,[27] knowing that the patients can always resume their original treatment,[30] others question their own ability to initiate medical changes.[31] Some GPs feel more competent in deprescribing medications for symptom management,[32] whereas others favour considering deprescribing of preventive medications.[25] Further, GPs are particularly uncertain when considering deprescribing of medication for dementia, Parkinson's disease and Alzheimer's disease.[31] Some physicians consider themselves as "good doctors" when continuing to prescribe, and thereby please the patients, whereas others believe that it is their responsibility to prevent misuse of medicines such as sleeping medication.[28] GPs are motivated to deprescribe by seeing patients getting better, and if the patients themselves are motivated for trying deprescribing.[26] |
| Information and education | Physicians do not always feel that they have the right competencies for deprescribing[26]; some find it difficult to determine the right timing for deprescribing, especially of preventive medications[26]; others feel incompetent in |

(Continues)

| | |
|---|---|
| | communicating risks and benefits[32]; and others are not always aware of the potentially adverse effects of some medications, making them more prone to continue prescribing them.[28] GPs generally experience a lack of information on evidence-based deprescribing[26,27] as well as education on how to deprescribe[27] and prescribe for older, multimorbid patients.[26] GPs, nurses and pharmacists also believe that nursing staff need more education,[27,31] as they consider some nursing personnel to lack nursing skills[29,31] and as being a hindrance for deprescribing in aged care facilities[27] |
| Evidence | HCPs find it challenging to deprescribe medication, particularly for cognitively impaired people, referring to the lack of evidence on medication use in people with dementia.[30] Further, GPs lack information on the benefits and risks of preventive medications in older people[32] and are uncertain about how to apply research evidence to patients with multimorbidity, especially evidence on the use of preventive medication.[26] Whereas pharmacists interpret this lack of information as providing insufficient evidence to change patients' medical treatment, some physicians view it as insufficient evidence to continue treatment.[30] |
| The impact of organizational factors | |
| Transitions | GPs perceive clear communication and continuity of care as facilitators for deprescribing.[26,27] However, GPs consider the communication between hospitals and primary care as insufficient; changes in patients' medical treatment are not always sufficiently communicated to primary care staff, and discharge summaries often lack information on the duration of treatment with new medications.[26] Consequently, physicians and pharmacists may have to assess the appropriateness of patients' medications on very scarce information[25,26,30]—eg without any biochemical results available or with no information on why and when a certain medication was prescribed.[25,30] Nursing staff and pharmacists also describe these medical changes as being troublesome, as they usually lead to an increased complexity in the residents' medication regimen'[31] |
| Workload | GPs and nursing staff find it difficult to deprescribe and adequately manage patients' medication, respectively, owing to insufficient staff availability.[26,27,29,31] Further, GPs describe the workflows in aged care facilities as heavy, with an onerous administrative load,[27] messy medication charts lacking standardization within and across LTCFs[26,27,31] and poorly integrated computer systems.[27] Whereas some GPs consider their reimbursement as insufficient for the amount of work and time required of them,[26,31] others report that their deprescribing practice is not influenced by financial factors[27] |
| Time | HCPs consider time constraints as a considerable hindrance for deprescribing.[26-29,31] Some GPs feel isolated in making decisions on patients' medical treatment, as they find it time consuming and difficult to consult a specialist.[27] Further, physicians do not always have time to see their patients themselves[26,28,29] and consequently have to rely on nursing staff's observations on patients' well-being and medical treatment.[26,29] In addition, some GPs are not always able to carry out a timely review of new medications, which leads to an accumulation in the patients' medications.[31] Nursing staff also describe not having sufficient time to observe and talk to patients, as they have to spend most of their time on basic nursing care and medication rounds[28,29,31] |
| Guidelines | GPs feel forced to prescribe many different medications because of the existence of disease-specific guidelines.[32] Some GPs believe that current deprescribing guidelines are complex to use, making it difficult to implement deprescribing in daily practice.[26] This ultimately forces the GPs to make decisions without guidance.[26] However, GPs mention that the presence of deprescribing guidelines per se do not change their prescribing behaviour.[26] On the other hand, using a deprescribing tool can help physicians and pharmacists to identify medication for deprescribing.[30] Some GPs believe that protocols for medication management can facilitate deprescribing by all HCPs providing care to residents in LTCFs[31] |

HCP, health care professional; LTCF, long-term care facility; NH, nursing home; GP, general practitioner.

different HCPs may be compromised by several factors and ultimately hinder deprescribing.[25-29,31,32] Three subthemes emerged within this theme: (i) interprofessional relationships; (ii) specialists; and (iii) pressure and requests (Table 3).

Although GPs believe that the treatment of older multimorbid patients requires the involvement of different groups of HCPs[26] and value multidisciplinary teamwork,[26,27,32] their engagement in collaboration with other HCPs is affected by earlier interprofessional experiences. Whereas some place a great deal of responsibility on other HCPs,[29] others are more reluctant to engage in collaboration.[31] Physicians' apparent lack of interest in collaboration is also recognized by some nurses.[29] Further, when considering deprescribing, GPs may hesitate to address specialist-prescribed medications[25-27] and also find collaboration with specialists on deprescribing decisions particularly challenging, referring to specialists as representing "their guideline".[32] Finally, physicians[25-29] and nurses[29] alike sometimes experience a feeling of pressure from nursing staff to prescribe certain medications. Again, some physicians report acquiescing to these types of requests, to avoid conflict.[28]

### 3.4.3 | Theme 3 HCPs' self-assurance and skills

HCPs' decisions on whether or not to initiate or suggest deprescribing in older people with limited life expectancy are highly affected by the individual HCP's self-assurance and capacity.[25-32] Four subthemes emerged within this theme: (i) responsibility and concerns; (ii) confidence and self-image; (iii) information and education; and (iv) evidence (Table 3).

Although pharmacists and nursing staff identify GPs as those responsible for deprescribing among older people with limited life expectancy,[26,28] GPs and other physicians may hesitate to initiate deprescribing owing to concerns related to the potential consequences for the patient,[26,29] as well as themselves.[26,28,32] Although some GPs express confidence with deprescribing,[27,30] others question their own ability to deprescribe,[31] and report a feeling of not holding the right competencies for deprescribing within this population.[26,28,32] Further, GPs experience a lack of information and education on evidence-based deprescribing[26,27] and physicians and pharmacists alike express a need for more evidence on deprescribing

within this particular population.[26,30,32] GPs, nurses and pharmacists also express a need for more education of nursing staff in order to facilitate deprescribing.[27,29,31]

### 3.4.4 | Theme 4 The impact of organizational factors

HCPs identify several organizational factors that influence medication management and deprescribing in older people with limited life expectancy.[25-32] Four subthemes emerged within this theme: (i) transitions; (ii) workload; (iii) time; and (iv) guidelines (Table 3).

Although GPs perceive clear communication and continuity of care as facilitators for deprescribing,[26,27] they often experience insufficient communication between primary and secondary care[26] and consequently find it difficult to manage patients' medications appropriately following discharge.[25,26,30] Pharmacists and nursing staff also recognize this problem.[31] Further, physicians and nursing staff report insufficient staff availability, heavy workflows and lack of time to complicate deprescribing and medication management further.[26-29,31] Finally, although some physicians and pharmacists consider deprescribing guidelines as being helpful in identifying medications for deprescribing,[30] others believe that current guidelines are too complex to implement in daily practice.[26] GPs also report feeling pressured to continue prescribing due to disease-specific guidelines.[32] GPs believe that deprescribing can be facilitated by protocols for medication management.[31]

## 4 | DISCUSSION

In this systematic review, we identified four themes related to HCPs' attitudes towards deprescribing in older people with limited life expectancy: (i) patient and relative involvement; (ii) the importance of teamwork; (iii) HCPs' self-assurance and skills; and (iv) the impact of organizational factors. Our results imply that HCPs' decisions to initiate or suggest deprescribing in this population depend on multiple factors which are highly interdependent. As such, deprescribing in older patients with limited life expectancy should be seen as a multifactorial process, meaning that initiatives to implement and/or facilitate deprescribing practices should target several of the possible issues identified in this review.

### 4.1 | Comparison with existing literature

Recent reviews have summarized HCPs' attitudes towards deprescribing in adults[17] and older people.[18] However, in order to examine if the presence of multiple competing factors such as multimorbidity, frailty and limited life expectancy somehow complicates deprescribing initiatives, we decided to explore HCPs' attitudes towards deprescribing specifically in the context of treatment of older people with limited life expectancy.

Anderson et al explored prescribers' perceived barriers and enablers to minimizing potentially inappropriate medications continuously prescribed in adults,[17] while Bokhof et al explored GPs' perspectives of, and experiences with, reducing polypharmacy in older people.[18] Although none of these reviews specifically address HCPs' attitudes towards deprescribing in older people with limited life expectancy, both reviews provide findings that are similar to ours within each of the identified four themes—ie on how deprescribing initiatives may be affected by patients, HCPs' joined teamwork, HCPs' self-assurance and organizational factors. Similar findings have also been demonstrated in a prior systematic review by Sinnott et al, exploring GPs' perspectives on the management of patients suffering from multimorbidity.[37]

However, compared with these reviews, our findings suggest that deprescribing in older people with limited life expectancy may be further complicated by at least two factors. First, HCPs report being considerably challenged when considering deprescribing in patients suffering from cognitive impairment.[30,31] As studies have shown that a large proportion of older people with limited life expectancy suffer from a cognitive impairment such as dementia,[38-40] our findings suggest a specific need for more evidence on how to approach deprescribing within this particular population. Second, as a result of the large proportion of this population suffering from cognitive impairment, HCPs sometimes find it necessary to involve relatives in treatment decisions.[26,28] However, despite the patients' limited life expectancy, HCPs often find themselves and relatives having opposite treatment goals, with the relatives being more prone to wanting treatment to be continued,[27,28,31] which may ultimately hinder deprescribing initiatives. Similar findings have been demonstrated in a recent study exploring nursing home doctors' experiences with treatment of dying patients, which found that doctors sometimes experience this pressure from relatives, even if the patients themselves do not want treatment.[41] Further, studies have shown that the relatives of older patients at the end of life are generally critical towards physicians' treatment decisions,[42] believe that the patients do not receive sufficient medical treatment[43] and consider the information from physicians as well as the information between different HCPs to be inadequate.[44,45]

In this review, we specifically focused on deprescribing in older people with limited life expectancy, meaning that we excluded studies focusing on deprescribing in people with a life-limiting illness such as advanced cancer. Deprescribing in people with a specific life-limiting illness constitutes a different clinical scenario. First, although it is always challenging for clinicians to predict mortality, an estimated life expectancy based on a progressive cancer diagnosis may be more reliable than one based on multiple competing diseases. In this way, both the patient and physician might realistically be more confident in deprescribing of eg preventive medications, as they are more certain that the end of life is approaching. Further, when a patient is diagnosed with a life-limiting illness and ultimately accepts its prognosis, this may change their attitude towards medication use, making it easier to carry out deprescribing initiatives. A recent qualitative study, exploring patients', caregivers', and HCPs' attitudes towards medication use in life-limiting illness, found that patients diagnosed with a life-limiting illness such as cancer, at this particular point, place less importance on taking certain medications. HCPs also describe this point as the

"transition"—ie as the point where patients accept their disease.[46] Another qualitative study, exploring the experiences of medication use among patients with advanced cancer, found that patients generally want to reduce the number of medications they take, as it reminds them of their illness.[47] As such, the willingness to deprescribe among these patients may differ significantly from that in older patients with limited life expectancy, as they, although suffering from multiple competing diseases, have not been diagnosed with a terminal illness.

Similarly to the previous literature,[17,18] this review found that HCPs may deviate from engaging in deprescribing activities because of low self-assurance.[25-32] A recent study exploring the effect of implementing evidence-based deprescribing guidelines found that such initiatives appear to increase long-term care clinicians' self-efficacy in developing and implementing deprescribing plans which target specific drug classes.[48] A recent systematic review has summarized available tools for deprescribing in frail older people and those with limited life expectancy[46] which clinicians may find helpful to address for future deprescribing strategies.

## 4.2 | Assessment of reporting

The completeness of reporting in the included studies was assessed according to COREQ.[24] The studies primarily lacked reporting within the first domain, meaning that personal bias cannot be ruled out.[24,50] Higher rates of reporting, and thereby higher transparency, were observed within the second and third domains. Although not being a tool to assess the quality of qualitative studies, the assessment according to COREQ ensured a critical review of the included studies, giving an overall impression of the quality of each study.

However, it should be noted that high reporting rates according to COREQ do not necessarily equate to high-quality studies. Even if a study reports all the items included in COREQ, the reporting of these may not be adequately described. For example, in this review, three out of the seven studies, which state their methodological orientation (content analysis,[25,30] and thematic coding and comparative categorization[28]), do not support this with any references. As any qualitative study explores the content and meaning of the empirical data, these terms say little about how the authors have analysed their data.[51] Consequently, researchers should be cautious about drawing definitive conclusions on the quality of qualitative studies based on assessments carried out according to COREQ.

## 4.3 | Strengths and limitations

The strengths of this review include the fact that screening, data extraction, data analysis and the assessment of reporting were performed by at least two authors, with final study selection discussed in the full author group. Further, the analysis was performed using an established method for synthesising qualitative data in systematic reviews[23] and, in order to enhance transparency, the reporting was carried out according to ENTREQ.[20] Finally, to enhance transparency further, as well as for the use of other researchers working with deprescribing, a summary of the 41 studies excluded during the full-text screening was completed (Appendix B).

Some limitations to our review should be acknowledged. First, the restriction to searching only three databases, as well as including only studies published in English, might have excluded relevant literature. Second, as the included studies concern only HCPs from primary care, the findings presented in this review may not apply to HCPs working in other settings. Further, although six of the included studies concern the use of multiple medications, the remaining two studies specifically concern the use of hypnotics[28] and antidepressants.[29] The views of the HCPs presented within these two studies might have been different if the studies had not been restricted to the use of specific drug classes. Finally, the definition of older people with limited life expectancy applied in this review may be associated with uncertainty. Although methods for predicting mortality[52] and identifying people at the end of life[53] have been reported, it is challenging for clinicians to predict the timing and course of the final year of a patient's life.[54] As an estimate for limited life expectancy, we therefore decided to include studies concerning older people residing in any type of aged care facility, or studies based on representative patient profiles that included relevant information from which the patients' life expectancy roughly could be estimated.

## 4.4 | Implications for practice

This review highlights a need for the development of initiatives targeting the identified possible issues which may hinder HCPs from engaging in deprescribing activities with older people with limited life expectancy. As these factors seem to be highly interdependent, initiatives should preferably be multidimensional. However, first and foremost, there seems to be an urgent need for more evidence on the effects of commonly used medications among this particular population. Further, more studies providing evidence on the safety of deprescribing of commonly used medications within this population should be conducted. A good example is a recent study showing that deprescribing of statins among older patients with an estimated life expectancy of $\leq$1 year is safe and may be associated with an improved quality of life.[55] This should be followed by more information and education on how to approach deprescribing in older patients with limited life expectancy, including those suffering from cognitive impairment, as well as the development of evidence-based deprescribing guidelines which can be implemented in daily practice. It is reasonable to expect that providing HCPs with such support may enhance their self-assurance and capacity to carry out more deprescribing[48] and also help them to approach "end of life" discussions with patients and relatives. Finally, it seems essential to educate and encourage all HCPs, not just physicians, to engage in deprescribing activities, in order to enhance the collaboration between different HCPs. As many different HCPs are frequently involved in medications management for this particular population, such initiatives should preferably target HCPs from within primary as well as secondary care.

## 5 | CONCLUSION

This systematic review suggests that HCPs' decisions to engage in deprescribing activities with older people with limited life expectancy depend on multiple factors which are highly interdependent. As such, initiatives to implement and/or facilitate deprescribing practices within this population should target several of the possible issues identified here. Most importantly, there seems to be an urgent need for more evidence on the beneficial effects of deprescribing specifically for older people with limited life expectancy, including more evidence on how to approach deprescribing in clinical practice within this population.

### ACKNOWLEDGEMENTS

The authors would like to acknowledge VELUX FONDEN for funding this study (grant no. 00018248).

### CONFLICTS OF INTEREST

There are no competing interests to declare.

### CONTRIBUTORS

Anton Pottegård proposed the initial study idea. All authors designed the study. Carina Lundby and Trine Graabæk performed the screening. All authors decided on the final study selection. Carina Lundby and Trine Graabæk performed the data extraction. Carina Lundby, Trine Graabæk and Dorthe Susanne Nielsen performed the data analysis. Carina Lundby wrote the initial draft. All authors participated in writing and revising the manuscript, as well as read and approved the final version of the manuscript.

### ORCID

*Carina Lundby* https://orcid.org/0000-0002-2121-6252
*Trine Graabæk* http://orcid.org/0000-0001-6848-3107
*Jens Søndergaard* http://orcid.org/0000-0002-1629-1864
*Anton Pottegård* https://orcid.org/0000-0001-9314-5679
*Dorthe Susanne Nielsen* http://orcid.org/0000-0002-3954-7551

### REFERENCES

1. Scott IA, Hilmer SN, Reeve E, et al. Reducing inappropriate polypharmacy: the process of deprescribing. *JAMA Intern Med*. 2015;175(5):827-834.
2. Qato DM, Wilder J, Schumm LP, Gillet V, Alexander GC. Changes in prescription and over-the-counter medication and dietary supplement use among older adults in the United States, 2005 *vs* 2011. *JAMA Intern Med*. 2016;176:473-482.
3. Sera LC, McPherson ML. Pharmacokinetics and pharmacodynamic changes associated with aging and implications for drug therapy. *Clin Geriatr Med*. 2012;28(2):273-286.
4. Marengoni A, Onder G. Guidelines, polypharmacy, and drug-drug interactions in patients with multimorbidity. *BMJ*. 2015;350:h1059.
5. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc*. 2015;63(11):2227-2246.
6. Hilmer SN, McLachlan AJ, Le Couteur DG. Clinical pharmacology in the geriatric patient. *Fundam Clin Pharmacol*. 2007;21(3):217-230.
7. Spall HGCV, Toren A, Kiss A, Fowler RA. Eligibility criteria of randomized controlled trials published in high-impact general medical journals: a systematic sampling review. *JAMA*. 2007;297(11):1233-1240.
8. Boyd CM, Darer J, Boult C, Fried LP, Boult L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. *JAMA*. 2005;294:716-724.
9. McNamara KP, Breken BD, Alzubaidi HT, et al. Health professional perspectives on the management of multimorbidity and polypharmacy for older patients in Australia. *Age Ageing*. 2017;46:291-229.
10. Holmes HM, Min LC, Yee M, et al. Rationalizing prescribing for older patients with multimorbidity: considering time to benefit. *Drugs Aging*. 2013;30:655-666.
11. Lee SJ, Leipzig RM, Walter LC. Incorporating lag time to benefit into prevention decisions for older adults. *JAMA*. 2013;310:2609-2610.
12. Woodward MC. Deprescribing: achieving better health outcomes for older people through reducing medications. *J Pharm Pract Res*. 2003;33(4):323-328.
13. Reeve E, Gnjidic D, Long J, Hilmer S. A systematic review of the emerging definition of "deprescribing" with network analysis: implications for future research and clinical practice. *Br J Clin Pharmacol*. 2015;80(6):1254-1268.
14. Wallis KA, Andrews A, Henderson M. Swimming against the tide: primary care physicians' views on deprescribing in everyday practice. *Ann Fam Med*. 2017;15(4):341-346.
15. Anderson K, Foster M, Freeman C, Luetsch K, Scott I. Negotiating "unmeasurable harm and benefit": perspectives of general practitioners and consultant pharmacists on deprescribing in the primary care setting. *Qual Health Res*. 2017;27(13):1936-1947.
16. Kouladjian L, Gnjidic D, Reeve E, Chen TF, Hilmer SN. Health care practitioners' perspectives on deprescribing anticholinergic and sedative medications in older adults. *Ann Pharmacother*. 2016;50(8):625-636.
17. Anderson K, Stowasser D, Freeman C, Scott I. Prescriber barriers and enablers to minimising potentially inappropriate medications in adults: a systematic review and thematic synthesis. *BMJ Open*. 2014;4(12):e006544.
18. Bokhof B, Junius-Walker U. Reducing polypharmacy from the perspectives of general practitioners and older patients: a synthesis of qualitative studies. *Drugs Aging*. 2016;33(4):249-266.
19. Moher D, Liberati A, Tetzlaff J, Altman DG, PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med*. 2009;151:264-269.
20. Tong A, Flemming K, McInnes E, Oliver S, Craig J. Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Med Res Methodol*. 2012;12:181.
21. Cooke A, Smith D, Booth A. Beyond PICO: the SPIDER tool for qualitative evidence synthesis. *Qual Health Res*. 2012;22:1435-1443.
22. Covidence – Better systematic review management [online]. https://www.covidence.org/home. Accessed December 20, 2017.
23. The Joanna Briggs Institue. Joanna Briggs Institute Reviewers' Manual: 2014 edition. Adelaide, South Australia: The Joanna Briggs Institute; 2014.
24. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International J Qual Health Care*. 2007;19(6):349-357.
25. Ailabouni NJ, Nishtala PS, Mangin D, Tordoff JM. General practitioners' insight into deprescribing for the multimorbid older individual: a qualitative study. *Int J Clin Pract*. 2016;70(3):261-276.

26. Ailabouni NJ, Nishtala PS, Mangin D, Tordoff JM. Challenges and enablers of deprescribing: a general practitioner perspective. *PLoS One*. 2016;11:e0151066.
27. Bolmsjö BB, Palagyi A, Keay L, Potter J, Lindley RI. Factors influencing deprescribing for residents in advanced care facilities: insights from general practitioners in Australia and Sweden. *BMC Fam Pract*. 2016;17:152.
28. Flick U, Garms-Homolová V, Röhnsch G. "And mostly they have a need for sleeping pills": physicians' views on treatment of sleep disorders with drugs in nursing homes. *J Aging Stud*. 2012;26:484-494.
29. Iden KR, Hjørleifsson S, Ruths S. Treatment decisions on antidepressants in nursing homes: a qualitative study. *Scand J Prim Health Care*. 2011;29:252-256.
30. Page AT, Etherton-Beer CD, Clifford RM, Burrows S, Eames M, Potter K. Deprescribing in frail older people – do doctors and pharmacists agree? *Res Soc Admin Pharm*. 2016;12:438-449.
31. Palagyi A, Keay L, Harper J, Potter J, Lindley RI. Barricades and brickwalls – a qualitative study exploring perceptions of medication use and deprescribing in long-term care. *BMC Geriatr*. 2016;16:15.
32. Schuling J, Gebben H, Veehof LJG, Haaijer-Ruskamp FM. Deprescribing medication in very elderly patients with multimorbidity: the view of Dutch GPs. A qualitative study. *BMC Fam Pract*. 2012;13:56.
33. Michie S, Johnston M, Abraham C, et al. Making psychological theory useful for implementing evidence based practice: a consensus approach. *Qual Saf Health Care*. 2005;14:26-33.
34. Fishbein M, Cappella JN. The role of theory in developing effective health communications. *J Commun*. 2006;56(suppl 1):S1-S17.
35. Malterud K. Shared understanding of the qualitative research process. Guidelines for the medical researcher. *Fam Pract*. 1993;10:201-206.
36. Bolmsjö BB, Strandberg EL, Midlöv P, Brorsson A. "It is meaningful; I feel that I can make a difference" – a qualitative study about GPs' experiences of work at nursing homes in Sweden. *BMC Fam Pract*. 2015;16:111.
37. Sinnott C, Mc Hugh S, Browne J, Bradley C. GPs' perspectives on the management of patients with multimorbidity: systematic review and synthesis of qualitative research. *BMJ Open*. 2013;3:e003610.
38. Hülür G, Wolf H, Riese F, Theill N. Cognitive change at the end of life in nursing home residents: differential trajectories of terminal decline. *Gerontology*. 2019;65(1):57-67.
39. Nazir A, Mueller C, Perkins A, Arling G. Falls and nursing home residents with cognitive impairment: new insights into quality measures and interventions. *J Am Med Dir Assoc*. 2012;13:819.e1-819.e6.
40. Kallin K, Gustafson Y, Sandman P-O, Karlsson S. Factors associated with falls among older, cognitively impaired people in geriatric care settings: a population-based study. *Am J Geriatr Psychiatry*. 2005;13:501-509.
41. Jansen K, Ruths S, Malterud K, Schaufel MA. The impact of existential vulnerability for nursing home doctors in end-of-life care: a focus group study. *Patient Educ Couns*. 2016;99:2043-2048.
42. Dees MK, Geijteman ECT, Dekkers WJM, et al. Perspectives of patients, close relatives, nurses, and physicians on end-of-life medication management. *Palliat Support Care*. 2018;16(5):580-589.
43. Teno JM, Clarridge BR, Casey V, et al. Family perspectives on end-of-life care at the last place of care. *JAMA*. 2004;291:88-93.
44. Weber M, Claus M, Zepf KI, Fischbeck S, Escobar Pinzon LC. Dying in Germany – unfulfilled needs of relatives in different care settings. *J Pain Symptom Manage*. 2012;44:542-551.
45. Fosse A, Schaufel MA, Ruths S, Malterud K. End-of-life expectations and experiences among nursing home patients and their relatives – a synthesis of qualitative studies. *Patient Educ Couns*. 2014;97:3-9.
46. Todd A, Holmes H, Pearson S, et al. "I don't think I'd be frightened if the statins went": a phenomenological qualitative study exploring medicines use in palliative care patients, carers and healthcare professionals. *BMC Palliat Care*. 2016;15:13.
47. Sand AM, Harris J, Rosland JH. Living with advanced cancer and short life expectancy: patients' experiences with managing medication. *J Palliat Care*. 2009;25(2):85-91.
48. Farrell B, Richardson L, Raman-Wilms L, de LD, Alsabbagh MW, Conklin J. Self-efficacy for deprescribing: a survey for health care professionals using evidence-based deprescribing guidelines. *Res Soc Admin Pharm*. 2018;14(1):18-25.
49. Thompson W, Lundby C, Graabaek T, et al. Tools for deprescribing in frail older persons and those with limited life expectancy: a systematic review. *J Am Geriatr Soc*. 2019;67(1):172-180.
50. Galdas P. Revisiting bias in qualitative research: reflections on its relationship with funding and impact. *Int J Qual Methods*. 2017;16(1). https://doi.org/10.1177/1609406917748992
51. Malterud K. Systematic text condensation: a strategy for qualitative analysis. *Scand J Public Health*. 2012;40(8):795-805.
52. Yourman LC, Lee SJ, Schonberg MA, Widera EW, Smith AK. Prognostic indices for older adults: a systematic review. *JAMA*. 2012;307:182-192.
53. White N, Kupeli N, Vickerstaff V, Stone P. How accurate is the 'Surprise Question' at identifying patients at the end of life? A systematic review and meta-analysis. *BMC Med*. 2017;15:139.
54. Hardy JE, Hilmer SN. Deprescribing in the last year of life. *J Pharm Pract Res*. 2011;41(2):146-151.
55. Kutner JS, Blatchford PJ, Taylor DH, et al. Safety and benefit of discontinuing statin therapy in the setting of advanced, life-limiting illness. *JAMA Intern Med*. 2015;175(5):691-700.
56. Ailabouni N, Tordoff J, Mangin D, Nishtala PS. Do residents need all their medications? A cross-sectional survey of RNs' views on deprescribing and the role of clinical pharmacists. *J Gerontol Nurs*. 2017;43:13-20.
57. Anthierens S, Tansens A, Petrovic M, Christiaens T. Qualitative insights into general practitioners views on polypharmacy. *BMC Fam Pract*. 2010;11:65.
58. Bell HT, Steinsbekk A, Granas AG. Factors influencing prescribing of fall-risk-increasing drugs to the elderly: A qualitative study. *Scand J Prim Health Care*. 2015;33:107-114.
59. Bourgeois J, Elseviers MM, Azermai M, Van Bortel L, Petrovic M, Vander Stichele RR. Barriers to discontinuation of chronic benzodiazepine use in nursing home residents: perceptions of general practitioners and nurses. *Eur Geriatr Med*. 2014;5:181-187.
60. Cantrill JA, Dowell J, Roland M. Qualitative insights into general practitioners' views on the appropriateness of their long-term prescribing. *Int J Pharm Pract*. 2000;8:20-26.
61. Clyne B, Cooper JA, Hughes CM, Fahey T, Smith SM. A process evaluation of a cluster randomised trial to reduce potentially inappropriate prescribing in older people in primary care (OPTI-SCRIPT study). *Trials*. 2016;17:386.
62. Clyne B, Cooper JA, Hughes CM, Fahey T, Smith SM. "Potentially inappropriate or specifically appropriate?" Qualitative evaluation of general practitioners views on prescribing, polypharmacy and potentially inappropriate prescribing in older people. *BMC Fam Pract*. 2016;17:109.
63. Cook JM, Marshall R, Masci C, Coyne JC. Physicians' perspectives on prescribing benzodiazepines for older adults: a qualitative study. *J Gen Intern Med*. 2007;22:303-307.
64. Cullinan S, Fleming A, O'Mahony D, et al. Doctors' perspectives on the barriers to appropriate prescribing in older hospitalized patients: a qualitative study. *Br J Clin Pharmacol*. 2015;79:860-869.

65. Dalleur O, Feron J-M, Spinewine A. Views of general practitioners on the use of STOPP&START in primary care: a qualitative study. *Acta Clin Belg*. 2014;69:251-261.

66. Damestoy N, Collin J, Lalande R. Prescribing psychotropic medication for elderly patients: some physicians' perspectives. *CMAJ*. 1999;161:143-145.

67. Dickinson R, Knapp P, House AO, et al. Long-term prescribing of antidepressants in the older population: a qualitative study. *Br J Gen Pract*. 2010;60:e144-e155.

68. Djatche L, Lee S, Singer D, Hegarty SE, Lombardi M, Maio V. How confident are physicians in deprescribing for the elderly and what barriers prevent deprescribing? *J Clin Pharm Ther*. 2018;43:550-555.

69. Dybwad TB, Kjølsrød L, Eskerud J, Laerum E. Why are some doctors high-prescribers of benzodiazepines and minor opiates? A qualitative study of GPs in Norway. *Fam Pract*. 1997;14:361-368.

70. Farrell B, Tsang C, Raman-Wilms L, Irving H, Conklin J, Pottie K. What are priorities for deprescribing for elderly patients? Capturing the voice of practitioners: a modified Delphi process. *PLoS One*. 2015;10:e122246.

71. Frich JC, Hoye S, Lindbaek M, Straand J. General practitioners and tutors' experiences with peer group academic detailing: a qualitative study. *BMC Fam Pract*. 2010;11:12.

72. Fried TR, Tinetti ME, Iannone L. Primary care clinicians' experiences with treatment decision making for older persons with multiple conditions. *Arch Intern Med*. 2011;171:75-80.

73. Ie K, Felton M, Springer S, Wilson SA, Albert SM. Physician factors associated with polypharmacy and potentially inappropriate medication use. *J Am Board Fam Med*. 2017;30:528-536.

74. Iliffe S, Curran HV, Collins R, Yuen Kee SC, Fletcher S, Woods B. Attitudes to long-term use of benzodiazepine hypnotics by older people in general practice: findings from interviews with service users and providers. *Aging Ment Health*. 2004;8:242-248.

75. Jubraj B, Marvin V, Poots AJ, et al. A pilot survey of junior doctors' attitudes and awareness around medication review: time to change our educational approach? *Eur J Hosp Pharm Sci Pract*. 2015;22:243-248.

76. Lesende IM, Crespo IM, Lopez GM, Zelaia IG, Parra JCA, Goicoechea AM. Potentiality of STOPP/START criteria used in primary care to effectively change inappropriate prescribing in elderly patients. *Eur Geriatr Med*. 2013;4:293-298.

77. Lindström K, Ekedahl A, Carlsten A, Mårtensson J, Mölstad S. Can selective serotonin inhibitor drugs in elderly patients in nursing homes be reduced? *Scand J Prim Health Care*. 2007;25:3-8.

78. Luymes CH, van der Kleij RMJJ, Poortvliet RKE, de Ruijter W, Reis R, Numans ME. Deprescribing potentially inappropriate preventive cardiovascular medication: barriers and enablers for patients and general practitioners. *Ann Pharmacother*. 2016;50:446-454.

79. Magin P, Goode S, Pond D. GPs, medications and older people: a qualitative study of general practitioners' approaches to potentially inappropriate medications in older people. *Australas J Ageing*. 2015;34:134-139.

80. Maio V, Jutkowitz E, Herrera K, Abouzaid S, Negri G, Del Canale S. Appropriate medication prescribing in elderly patients: how knowledgeable are primary care physicians? A survey study in Parma, Italy. *J Clin Pharm Ther*. 2011;36:468-480.

81. Mavrodaris A, Philp I. Reducing antipsychotic prescriptions in primary care: a healthcare perspective. *J Public Ment Health*. 2013;12:32-42.

82. Moen J, Norrgård S, Antonov K, Nilsson JLG, Ring L. GPs' perceptions of multiple-medicine use in older patients. *J Eval Clin Pract*. 2010;16:69-75.

83. Ní Chróinín D, Ní Chróinín C, Beveridge A. Factors influencing deprescribing habits among geriatricians. *Age Ageing*. 2015;44:704-708.

84. Parr JM, Kavanagh DJ, Young RM, McCafferty K. Views of general practitioners and benzodiazepine users on benzodiazepines: a qualitative analysis. *Soc Sci Med*. 2006;62:1237-1249.

85. Ramaswamy R, Maio V, Diamond JJ, et al. Potentially inappropriate prescribing in elderly: assessing doctor knowledge, confidence and barriers. *J Eval Clin Pract*. 2011;17:1153-1159.

86. Sinnott C, Hugh SM, Boyce MB, Bradley CP. What to give the patient who has everything? A qualitative study of prescribing for multimorbidity in primary care. *Br J Gen Pract*. 2015;65:e184-e191.

87. Smith SM, O'Kelly S, O'Dowd T. GPs' and pharmacists' experiences of managing multimorbidity: a 'Pandora's box'. *Br J Gen Pract*. 2010;60:e285-e294.

88. Spinewine A, Swine C, Dhillon S, et al. Appropriateness of use of medicines in elderly inpatients: qualitative study. *BMJ*. 2005;331:935-938.

89. Šubelj M, Vidmar G, Švab V. Prescription of benzodiazepines in Slovenian family medicine: a qualitative study. *Wien Klin Wochenschr*. 2010;122:474-478.

90. Turner JP, Edwards S, Stanners M, Shakib S, Bell JS. What factors are important for deprescribing in Australian long-term care facilities? Perspectives of residents and health professionals. *BMJ Open*. 2016;6:e009781.

91. Voigt K, Gottschall M, Koberlein-Neu J, Schubel J, Quint N, Bergmann A. Why do family doctors prescribe potentially inappropriate medication to elderly patients? *BMC Fam Pract*. 2016;17:93.

92. Wu A, Reeve E, Hilmer S, Gnjidic D. Hospital pharmacists' beliefs about optimising statin therapy in older inpatients. *J Pharm Pract Res*. 2017;47:223-227.

**How to cite this article:** Lundby C, Graabæk T, Ryg J, Søndergaard J, Pottegård A, Nielsen DS. Health care professionals' attitudes towards deprescribing in older patients with limited life expectancy: A systematic review. *Br J Clin Pharmacol*. 2019;1–25. https://doi.org/10.1111/bcp.13861

## APPENDIX A

### Search strategy

The following electronic databases were searched from inception to December 2017: MEDLINE (via Ovid SP), EMBASE (via Ovid SP) and CINAHL. The searches were conducted combining keywords for "Population" (older people with limited life expectancy) and "Intervention" (deprescribing), according to the Population, Intervention, Comparison and Outcome (PICO) model.[21] The following search strategy was used:

(frail OR elderly OR old OR older OR "end of life" OR "eol" OR "life-limiting illness")

*AND*

(deprescribe OR deprescribing OR deprescription OR "medication cessation" OR "medication withdrawal" OR "medication discontinuation" OR "inappropriate prescribing" OR "inappropriate medications" OR "inappropriate medication" OR "unnecessary prescription" OR "unnecessary prescriptions")

The searches were restricted by filters for conference abstracts. In addition to identification of original literature, reference lists of relevant reviews were also reviewed to identify potentially eligible studies.

# APPENDIX B

## Studies excluded during full-text screening

**TABLE A1** Characteristics of the 41 excluded studies as presented in the individual papers[a]

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Exclusion reason |
|---|---|---|---|---|---|---|
| Ailabouni, 2017, New Zealand[56] | To investigate registered nurses' views and perceptions on medication use and deprescribing in residential care settings | Multiple medications | 91 registered nurses | Residents in RACFs | Cross-sectional survey | Wrong method |
| Anderson, 2017, Australia[15] | To explore the views of GPs and CPs about inappropriate polypharmacy and the reasoning they apply to deprescribing in primary care, and to identify factors that support or inhibit this cognitive process | Multiple medications | 32 GPs and 15 CPs | Frail community-dwelling older adult with multimorbidity and polypharmacy, but without a terminal prognosis (one case study) | Focus group interviews | Patients without a limited life expectancy |
| Anthierens, 2010, Belgium[57] | To describe GPs' views and beliefs on polypharmacy in order to identify the role of the GP in relation to improving prescribing behaviour | Multiple medications | 65 GPs | Older patients | Semi-structured interviews | Patients without a limited life expectancy |
| Bell, 2015, Norway[58] | To explore whether GPs associate drug use with falls among their elderly patients, and the factors influencing the prescribing and cessation of FRIDs | FRIDs (defined as psychotropic, antihypertensive and cardiovascular drugs in this study) | 13 GPs | Older patients | Semi-structured focus group interviews | Patients without a limited life expectancy |
| Bourgeois, 2014, Belgium[59] | To investigate the initiation, indications, previous stop attempts, and perceived benefit and harm of benzodiazepines, as well as the willingness to stop chronic benzodiazepine use in individual NH residents | Benzodiazepines | 25 GPs and 16 nurses | NH residents with at least 3 months of benzodiazepine use | Resident-specific questionnaire | Wrong method |
| Cantrill, 2000, England[60] | To use these indicators [nine previously | Multiple medications | 22 GPs | Not specified | Face-to-face interviews, telephone interviews, | Patients <65 years (median) |

(Continues)

**TABLE A1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Exclusion reason |
|---|---|---|---|---|---|---|
| | validated indicators of the appropriateness of long-term prescribing] to explore factors which might contribute to inappropriate long-term prescribing by GPs in the UK | | | | joint interviews and group discussion | |
| Clyne, 2016, Ireland[b,61] | To explore how the intervention [in the OPTI-SCRIPT trial] was implemented, the experiences of those participating in the study and lessons for future implementation | Multiple medications | 17 GPs | Patients aged 70 years and over | Semi-structured interviews (either in person or via telephone) | Patients without a limited life expectancy |
| Clyne, 2016, Ireland[b,62] | To explore GP perspectives regarding prescribing and PIP in older primary care patients | Multiple medications | 17 GPs | Older primary care patients | One-to-one semi-structured interviews (either in person or via telephone) | Patients without a limited life expectancy |
| Cook, 2007, USA[63] | To understand factors influencing the chronic use of benzodiazepines in older adults | Benzodiazepines | 33 practising primary care physicians | Older community-residing adults | Semi-structured interview (either face to face or by telephone) | Patients without a limited life expectancy |
| Cullinan, 2015, Ireland[64] | Using the TDF to: (i) explore hospital doctors' perceptions as to why PIP occurs; (ii) identify the barriers to addressing the issues identified, thus identifying potential targets for intervention; and (iii) use the behaviour change wheel to determine which intervention types would be best suited | Multiple medications | 22 hospital doctors | Older patients | Semi-structured interviews | Patients without a limited life expectancy |
| Dalleur, 2014, Belgium[65] | To explore the views of GPs on the use of the STOPP/START tool in daily practice | Multiple medications | 27 GPs | Older patients | Focus group interviews | Patients without a limited life expectancy |
| Damestoy, 1999, Canada[66] | To explore physicians' perceptions and attitudes, and the decision-making process | Psychotropic medications | 9 physicians | Older patients | Semi-structured interviews | Patients without a limited life expectancy |

(Continues)

**TABLE A1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Exclusion reason |
|---|---|---|---|---|---|---|
| | associated with prescribing psychotropic medications for older patients | | | | | |
| Dickinson, 2010, England[67] | To explore the beliefs and behaviours of patients and GPs who have experience of long-term (≥2 years) antidepressant prescription | Antidepressants | 10 GPs | Older patients | In-depth semi-structured interviews | Patients without a limited life expectancy |
| Djatche, 2018, USA[68] | To determine physicians' perceptions of deprescribing in older patients and assess the perceived potential barriers among physicians in the local health authority of Parma, Emilia-Romagna, Italy | Multiple medications | 160 primary care physicians | Older patients | 9-item questionnaire | Wrong method |
| Dybwad, 1997, Norway[69] | To understand and determine factors that result in variations between GPs, in order to form a hypothesis and build theories about prescribing | Benzodiazepines and minor opiates | 38 GPs | Not specified | Semi-structured interviews | Patients <65 years (median) |
| Farrell, 2015, Canada[70] | Using a Delphi consensus process to engage physicians, pharmacists and nurses in identifying and prioritizing medication classes where evidence-based deprescribing guidelines would be of benefit to clinicians | Multiple medications | 8 geriatricians, 11 family physicians, 36 pharmacists and 10 nurse practitioners | Older patients | Modified Delphi approach (including a literature review, an expert panel to develop survey content, and three survey rounds to seek consensus on priorities) | Wrong method |
| Frich, 2010, Norway[71] | To explore GPs and tutors' experiences with peer group academic detailing, and to explore GPs' reasons for deviating from recommended prescribing practice | Multiple medications | 39 GPs and 20 tutors | Older patients | Focus group interviews | Patients without a limited life expectancy |

(Continues)

**TABLE A1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Exclusion reason |
|---|---|---|---|---|---|---|
| Fried, 2011, USA[72] | To explore clinicians' perspectives of, and experiences with, therapeutic decision-making for older persons with multiple medical conditions | Multiple medications | 36 physicians, 2 nurse practitioners, 1 pharmacist and 1 physician assistant | Older persons with multiple medical conditions | Focus group interviews | Patients without a limited life expectancy |
| Ie, 2017, USA[73] | To investigate variability in prescription patterns for multimorbid elderly patients across family physicians and to explore factors related to prescription pattern variation, with the goal of informing interventions to reduce potentially harmful prescription | Multiple medications | 61 physicians | Multimorbid older patients | Survey | Wrong method |
| Iliffe, 2004, UK[74] | To explore beliefs and attitudes about continuing or stopping benzodiazepine hypnotics among older patients using such medicines, and among their GPs | Benzodiazepine hypnotics | 72 GPs, 5 practice managers, 4 practice nurses and 2 counsellors | Older patients with long-term use of benzodiazepine hypnotics | Non-standardized (conversational) interview approach (discussion) | Wrong method |
| Jubraj, 2015, UK[75] | To: (i) elicit junior doctors' attitudes to, and awareness of, the need to review medicines in older patients; (ii) explore factors that may hinder medication review and deprescribing; and (iii) use this information to formulate a "bottom-up" approach to educate foundation and undergraduate doctors and pharmacists in preparation for their roles in medication review | Multiple medications | 20 foundation year one doctors | Older patients | Online questionnaire survey | Wrong method |
| Kouladjian, 2016, Australia[16] | To explore the perspectives of HCPs on: (i) deprescribing | Anticholinergic and sedative medications | 12 accredited pharmacists, 12 GPs | Older adults | Focus group interviews and one-on-one interviews | Patients without a limited life expectancy |

(Continues)

**TABLE A1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Exclusion reason |
|---|---|---|---|---|---|---|
| | anticholinergic and sedative medications in older adults; and (ii) the design and implementation of a report on the DBI for older adults into the medication management review setting | | and 13 specialist physicians | | | |
| Lesende, 2013, Spain[76] | To analyse the potentiality of the STOPP/START criteria to change inappropriate prescribing, considering the acceptance by GPs of the recommendations obtained after applying the toolkit in a sample of patients on multiple medications aged ≥65, and GP perception of its usefulness | Multiple medications | 20 GPs | Patients aged ≥65 years on four medications or more | Data collection from electronic medical records and interviews with GPs | Wrong method |
| Lindström, 2007, Sweden[77] | To investigate whether SSRI treatment could be withdrawn for older residents in NHs who had been on treatment for at least 1 year without indications for long-term treatment, and to evaluate a method for systematic drug review in NHs | SSRIs | 15 physicians and 19 nurses | Older NH residents with ongoing treatment with SSRIs for more than 1 year | Semi-structured telephone interviews | Wrong method |
| Luymes, 2016, the Netherlands[78] | To identify the barriers and enablers encountered in real-life discussions between patients and their GPs, considering deprescribing preventive cardiovascular medications | Preventive cardiovascular medications | 10 GPs | Low-CVD-risk patients | Audiotaping of deprescribing consultations | Patients <65 years (median) |
| Magin, 2015, Australia[79] | To explore potentially inappropriate prescribing by Australian GPs by examining the context of PIMs use in community-dwelling older patients | Multiple medications | 22 GPs | Community-dwelling older patients | Semi-structured telephone interviews | Patients without a limited life expectancy |

(Continues)

**TABLE A1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Exclusion reason |
|---|---|---|---|---|---|---|
| Maio, 2011, USA[80] | To assess primary care physicians' knowledge of appropriate prescribing in older patients | Multiple medications | 155 primary care physicians. | Older patients | 19-item questionnaire | Wrong method |
| Mavrodaris, 2013, UK[81] | To investigate current antipsychotic agent prescribing practices and patient review in primary care | Antipsychotic agents | 60 GPs and 28 care home participants | People with dementia | Questionnaire | Wrong method |
| Moen, 2010, Sweden[82] | To describe multiple-medicine use from GPs' perspective | Multiple medications | 4 private GPs and 27 county-employed GPs | Older patients | Focus group discussions | Patients without a limited life expectancy |
| Ní Chróinín, 2015, Australia[83] | To explore factors influencing deprescribing practices among specialist physicians caring for older patients with progressive frailty, dependency and cognitive decline | Multiple medications | 134 physicians | Older patients with progressive frailty, dependency and cognitive decline | 2-component electronic survey | Wrong method |
| Parr, 2006, Australia[84] | To gain more detailed understanding of GP and benzodiazepine users' perceptions relating to starting, continuing and stopping benzodiazepine use | Benzodiazepines | 28 GPs | 23 benzodiazepine users | Semi-structured face-to-face interviews | Patients <65 years (median) |
| Ramaswamy, 2011, USA[85] | To: (i) examine doctors' knowledge of inappropriate prescribing in older people; (ii) evaluate doctors' confidence in their prescribing for older people; and (iii) identify perceived barriers to appropriate prescribing in older people | Multiple medications | 89 doctors | Older people | Questionnaire | Wrong method |
| Sinnott, 2015, Ireland[86] | To explore how and why GPs make decisions when prescribing for multimorbid patients, with a view to informing the design interventions to assist prescribing and multimorbidity care | Multiple medications | 20 GPs | Multimorbid patients | In-depth qualitative interviews | Patients <65 years (median) |

(Continues)

**TABLE A1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Exclusion reason |
|---|---|---|---|---|---|---|
| Smith, 2010, Ireland[87] | To document the views and beliefs of professionals working with patients to manage multimorbidity in primary care, specifically those of GPs and pharmacists who are particularly involved in such care | Multiple medications | 13 GPs and 7 pharmacists | Patients with multimorbidity | Focus group interviews | Patients without a limited life expectancy |
| Spinewine, 2005, Belgium[88] | To explore the appropriateness of use of medicines for patients admitted to wards for the care of older people, from the perspectives of HCPs and patients | Multiple medications | 5 doctors, 4 nurses and 3 pharmacists | Older inpatients | Individual semi-structured interviews and ward observations | Patients without a limited life expectancy |
| Šubelj, 2010, Slovenia[89] | To understand and determine factors that influence prescription variations between family physicians from their own point of view, allowing substantial explanation of the circumstances and prescription habits | Benzodiazepines | 10 family physicians | Patients on benzodiazepines | Interviews. | Patients <65 years (median) |
| Todd, 2016, UK[46] | To explore the lived experience of patients, carers and HCPs in the context of medication use in life-limiting illness | Multiple medications | 3 palliative medicine consultants, 3 advanced nurse practitioners and 6 GPs | Palliative care patients | In-depth interviews | Patients <65 years (median) |
| Turner, 2016, Australia[90] | To rank factors that GPs, nurses, pharmacists and residents perceive as most important when deciding whether or not to deprescribe medications | Multiple medications | 19 GPs, 12 nurses and 14 pharmacists | LTCF residents | Nominal group technique | Wrong method |
| Voigt, 2016, Germany[91] | To examine reasons for PIM prescription: (i) in general; and (ii) using real individual case vignettes of family practitioners that were detected beforehand through record analysis | Multiple medications | 7 family practitioners | Older patients with ≥2 chronic conditions and ≥2 related long-term medications | Semi-standardized content analysis of patients' records and qualitative interviews | Patients without a limited life expectancy |

(Continues)

**TABLE A1** (Continued)

| Study details (first author, publication year, country, reference number) | Aim | Medication | Participants | Patients | Methods | Exclusion reason |
|---|---|---|---|---|---|---|
| Wallis, 2017, New Zealand[14] | To explore the views of primary care physicians on the barriers to, and facilitators of, deprescribing in everyday practice, to inform the development of an intervention to support safer prescribing | Multiple medications | 24 primary care physicians | Older people | Semi-structured interviews (either face to face or by telephone) | Patients without a limited life expectancy |
| Wu, 2017, Australia[92] | To assess hospital pharmacists' perspectives and attitudes on their roles in optimizing statin therapy for older inpatients | Statins | 108 hospital pharmacists | Older inpatients | 13-item questionnaire | Wrong method |

[a]Some studies encompass perspectives of other than HCPs—eg patients. Only data concerning HCPs are presented in this table.

[b]The results presented in these two papers originate from the same study—ie they represent the same 17 GPs.

CP, consultant pharmacist; CVD, cardiovascular disease; DBI, Drug Burden Index; FRID, fall-risk-increasing drug; GP, general practitioner; HCP, health care practitioner/professional; LTCF, long-term care facility; NH, nursing home; OPTI-SCRIPT, OPTImizing PreSCRIbing for Older People in Primary Care, a clusTer randomized controlled trial; PIM, potentially inappropriate medication; PIP, potentially inappropriate prescribing; RACF, residential aged care facility; SSRI, selective serotonin reuptake inhibitor; START, Screening Tool to Alert to Right Treatment; STOPP, Screening Tool of Older People's Prescriptions; TDF, theoretical domains framework.