

ORIGINAL ARTICLE

Polypharmacy and medication deprescribing: A survey among multimorbid older adults in Denmark

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Abstract

Polypharmacy is common among multimorbid adults and associated with increased morbidity and mortality. Excessive polypharmacy (ie, ≥ 10 medicine) is strongly associated with inappropriate medication use, but little is known about attitudes toward deprescribing in patients with excessive polypharmacy. We surveyed 100 Danish individuals aged 65 years and above with ≥ 10 prescribed medications, using the validated Patients' Attitudes Towards Deprescribing (PATD) instrument. Most participants (81, 81%) thought they took a large number of medications, and 79 (79%) believed that their medications were necessary. Even so, 85 (85%) reported that they would be willing to stop taking one or more of their regular medications if their doctor told them they could, and 11 (11%) felt that they took at least one regular medication that they no longer needed. When presented with visual presentation of various amounts of tablets and capsules, 62 (62%) of participants reported that they would be comfortable taking fewer medications than they did. Forty-two (42%) participants had experience with stopping a regular medication. Almost all participants (92%) wanted to receive follow-up by various means if a medication was discontinued. Forty-one (41%) participants were interested in a consultation at an outpatient clinic specializing in polypharmacy. Overall, the answers to the PATD questionnaire suggest that our cohort of Danish, multimorbid outpatients with extensive polypharmacy have a high confidence in their healthcare providers for medication-related decisions, even though some feel that they are taking more medications than they would like to and feel that some medications may be unnecessary. Our results underline the need for healthcare providers to offer medication reviews in patients with multimorbidity.

KEYWORDS

deprescribing, multimorbidity, patient perspective, polypharmacy

Abbreviations: PATD, Patients' Attitudes Towards Deprescribing; SMC, Shared Medicine Card; DHS, Danish Healthcare System.

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1 | INTRODUCTION

Elderly persons and those with multiple chronic medical conditions such as chronic obstructive lung disease and diabetes are often treated with numerous drugs prescribed by several physicians.¹ Concurrent treatment with several drugs, known as polypharmacy, is costly for society and comprises a risk for medication interactions, adverse effects, hospitalizations, and increased mortality.² Excessive or severe polypharmacy (ie ≥ 10 medicine) is strongly associated with inappropriate medication use^{3,4} and might represent a large pill burden to patients. Results from prior studies indicate that it can be beneficial to decrease the number of medications among multimorbid patients to reduce the risk of medication-related harms.^{5,6} However, few studies have investigated patients' attitudes toward their use of medications and potential withdrawal of prescriptions, ie, deprescribing.

The Patients' Attitudes Towards Deprescribing (PATD) instrument was developed in 2013.⁷ Studies based on this questionnaire from Italy⁸ and Australia⁹⁻¹¹ suggest that most hospitalized older patients,^{8,10} outpatients,⁹ and nursing home residents¹¹ think they take a large number of medications and would like to reduce the number of drugs they take on a daily basis. However, patients in these studies generally were not treated with excessive polypharmacy.⁷⁻¹¹

Thus, in this study we aimed to elucidate the attitudes toward medications and potential deprescribing in a group of elderly outpatients treated with excessive polypharmacy.

2 | MATERIALS AND METHODS

To examine patients' attitudes toward medications and deprescribing, a structured questionnaire survey was conducted among individuals aged 65 years and above with 10 or more prescribed medications. Participants were recruited from two outpatient clinics (Department of Endocrinology and Department of Respiratory Medicine) at Bispebjerg and Frederiksberg University Hospital in Copenhagen. Patients who fulfilled the inclusion criteria: age 65 years and above, and having 10 or more prescribed medication on the day of their visit to one of the two outpatient clinics were included in the study. Patients not able to cooperate in filling out the questionnaire ie, with significant hearing impairment, limited cognitive capacity and/or not able to speak or understand Danish were excluded.

All medications with an ATC code (including as-needed medications) were included in the study when tallying the number of drugs. If the same formulation and active pharmaceutical substance was listed for both regular and as-needed use, it counted as a single medication. The following medications were excluded: viscous eye drops, topical lotions, oyster shells (calcium supplementation used in Denmark), and antibiotics. Information about the number of prescribed drugs was obtained from participants' prescription register Shared Medicine Card (SMC). The SMC is a central Danish database that contains information on all registered Danish citizens'

prescriptions for the two most recent years. During data collection, 366 patients met inclusion criteria and were scheduled with an appointment in either the Department of Endocrinology or the Department of Respiratory Medicine. However, a significant number of these patients did not keep their appointments and were therefore not included in the study. In addition, some patients declined participation due to fatigue, illness, or lack of time. Patients received oral and written information about the study and gave written informed consent to participate, including consent to access the hospital electronic patient record.

We used the validated PATD instrument,¹² which includes questions related to patients' attitudes toward their health, use of medications, and challenges experienced during contact with the healthcare system. Following World Health Organization guidelines,¹³ we translated the questionnaire to the Danish language using forward-backward translation. The questionnaire was pilot tested on five patients during interviews, and the questionnaire was revised based on the interview results. Item 9, assessing how medication costs impacted patients' attitudes and willingness to deprescribe, was modified to make it applicable to patients in the Danish Healthcare System (DHS). In the DHS, drugs prescribed at hospitals are free at the point of delivery, but those prescribed in the primary care sector, primarily by general practitioners, are subject to reimbursement. The degree of reimbursement depends on individual patients' annual medication costs.¹⁴ The original wording of item 9, "Having to pay for my medications would play a role in my willingness to stop one or more of them" was revised to "The cost of medications impacts my willingness to stop one or more of them" in the Danish version of PATD.

We expanded the questionnaire by including items about demographics (age, gender, and educational level), self-rated health (one item), and health literacy (four items from The Australian Health Literacy Questionnaire translated and validated into Danish).¹⁵ Participants were also asked whether they were interested in being contacted for an appointment at an outpatient clinic with a special focus on their medications.

Participants completed the questionnaire, which was distributed and collected by a pharmacist, at the outpatient clinics and could ask the pharmacist questions about the items in the questionnaire. The data collection was stopped when a total of 100 patients had completed the questionnaire.

Information about the number of participants' diagnoses was collected from their electronic patient records from the hospital. Multimorbidity was defined as having two or more of the following chronic conditions: diabetes, cancer, chronic back pain, osteoarthritis, osteoporosis, joint disease, allergies, chronic obstructive pulmonary disease, dementia (excluded from this study), schizophrenia, long-term use of antidepressants, anxiety, high cholesterol, hypertension, stroke, heart disease, and chronic pain.¹⁶

The study was approved by the Danish Data Protection Agency (No. BFH-2016-050). According to Danish law, ethical permission is not required for survey studies.

3 | RESULTS

3.1 | Participant characteristics

A total of 63 women and 37 men participated in the survey. Their median age was 75 years (range, 65-92), and 63 (63%) participants had short or no further education. More than half of the participants lived alone (69, 69%). The median number of prescribed medications was 12 (range, 10-32), and all participants had two or more chronic conditions; the median number of conditions was 6 (range, 2-11). The most prevalent chronic condition was heart disease (87, 87%), hypertension (86, 86%), dyslipidaemia (69, 69%), chronic pain (58, 58%), diabetes (56, 56%), COPD (42, 42%), and osteoporosis (39, 39%). More than half of the participants (59, 59%) rated their health as fair or poor. The major part of the participants (93, 93%) reported that they felt that it was very easy or easy to talk about health issues with healthcare professionals and to follow guidance from healthcare professionals (Table 1).

3.2 | Attitudes toward medications and deprescribing

Most participants (81, 81%) thought they took a large number of medications. Most participants (65, 65%) also reported feeling confident about taking the number of medications they did, and 79 (79%) believed that their medications were necessary (Table 2). When responding to visual cues showing certain amounts of tablets or capsules, 62 (62%) participants reported that they would feel comfortable with a maximum of daily intake of eight tablets or capsules (Table 3). Conversely, 85 (85%) reported that they would be willing to stop taking one or more of their regular medications if their doctor told them they could do so (Table 2). Approximately one in ten (11, 11%) felt that they took at least one regular medication that they no longer needed (Table 2).

More than two-thirds of participants (71, 71%) reported that it would be acceptable to take even more medications for their conditions. Less than half of participants (40, 40%) believed that one or more of their medications were causing side effects (Table 2). The majority of participants (85, 85%) reported that they had a good understanding of the indication for their medications. For 18 (18%) participants, the cost of medications influenced their willingness to stop taking them (Table 2). Less than half of participants (42, 42%) had experience with stopping one of their regular medications: of these, 16 (38%) reported that they did not need the withdrawn medication, whereas 25 (60%) reported that they had to restart the medication or start a new one (Table 3).

Asked about what type of follow-up they would prefer if one or more medications were withdrawn, 67 (67%) participants answered that they would want personal contact, and 48 (48%) also wanted to receive written information via post or e-mail. Approximately one in five participants (19, 19%) responded that they preferred to receive follow-up via telephone, and 8 (8%) participants indicated that they wanted no follow-up (Table 3).

TABLE 1 Characteristics of participants, n (%)

	N = 100
Age in years, median (range)	75 (65-92)
Gender	
Male	37 (37)
Female	63 (63)
Living alone	69 (69)
Education	
Short or no further education	63 (63)
Higher or postgraduate education	37 (37)
Number of prescribed medications, median (range)	12 (10-32)
Number of chronic conditions, median (range)	6 (2-11)
Multimorbidity (two or more chronic conditions)	100 (100)
Heart disease	87 (87)
Hypertension	86 (86)
Dyslipidemia	69 (69)
Chronic pain	58 (58)
Diabetes	56 (56)
COPD	42 (42)
Osteoporosis	39 (39)
Self-rated health	
Excellent	4 (4)
Very good	8 (8)
Good	29 (29)
Fair	38 (38)
Poor	21 (21)
Health literacy	
Very easy or easy to talk to about health issues with healthcare professionals	93 (93)
Very easy or easy to follow guidance from healthcare professionals	93 (93)
Very easy or easy to read and understand written information about health	61 (61)
Very easy or easy to read and understand all information on medication packages	49 (49)

Finally, 41 (41%) participants reported that they would be interested in a consultation in an outpatient clinic focusing on polypharmacy. A similar proportion (42, 42%) reported that they were not interested, 15 (15%) responded that they were unsure about whether they would like a consultation, and 2 (2%) did not respond.

The supplementary tables revealed that there was no association between the participants' attitudes towards medication and deprescribing and self-rated health. Likewise, we found no association between the participants' attitudes toward medication and deprescribing and health literacy.

TABLE 2 Responses to PATD items 1-10 (n = 100), n (%)

	N = 100				
	Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1. I feel that I am taking a large number of medications	73 (73)	8 (8)	2 (2)	14 (14)	3 (3)
2. I am comfortable with the number of medications I am taking	54 (54)	11 (11)	10 (10)	22 (22)	3 (3)
3. I believe that all my medications are necessary	68 (68)	11 (11)	4 (4)	7 (7)	9 (9)
4. If my doctor said it was possible, I would be willing to stop one or more of my regular medications	78 (78)	7 (7)	1 (1)	12 (12)	2 (2)
5. I would like to reduce the number of medications I am taking	74 (74)	8 (8)	2 (2)	11 (11)	3 (3)
6. I feel that I may be taking one or more medications that I no longer need	9 (9)	2 (2)	6 (6)	57 (57)	25 (25)
7. I would accept taking more medications for my health conditions	61 (61)	10 (10)	2 (2)	25 (25)	2 (2)
8. I have a good understanding of the reasons I was prescribed each of my medications	83 (83)	2 (2)	3 (3)	12 (12)	0 (0)
9. The cost of medications impacts my willingness to stop one or more of them	18 (18)	0 (0)	1 (1)	76 (76)	3 (3)
10. I believe one or more of my medications is causing side effects	35 (35)	5 (5)	2 (2)	43 (43)	14 (14)

PATD, Patients' Attitudes Towards Deprescribing.

4 | DISCUSSION

Our cohort of multimorbid, Danish outpatients taking 10 or more medications felt that they had a large number of current prescriptions, although most participants were comfortable with the number of medications they took. Most of the participants believed that their medications were necessary, and only few of the participants felt that they took unnecessary medication, which contrasts with the literature stating a high degree of inappropriate prescriptions in populations with excessive polypharmacy.¹⁷ A previous study from the DHS focusing on the quality of care for patients with multiple chronic conditions, found that patients with a high number of prescribed medications often have inappropriate medications on their list of prescribed medications.¹ Thus, it seems that patients with a high number of prescribed medications can be comfortable with the medicine they take even though some of the medicine may be inappropriate. In line with this, results from an Australian study focusing on patients' attitudes toward deprescribing showed that the willingness to deprescribe depended on patients' perceptions about medication appropriateness, fear of adverse outcomes related to withdrawal, dislike of taking medications, and the availability of a process for withdrawal.¹²

Further, when participants were presented with visual cues of tablets and capsules, their responses suggested that they were not comfortable with the number of medications they actually took on a daily basis (verified by their medical records). It is unclear to what extent participants had a full overview of their overall medication use. Paradoxically, most participants reported a good understanding of the reasons they were prescribed each of their medications. Thus, differences may exist between what patients and healthcare professionals perceive as a good understanding of the rationales for numerous medications. Although it is beyond the scope of our study, investigating the knowledge of patients who report a good







understanding of their treatment could be an interesting focus of future research.

Forty percent of participants believed that one or more of their medications were causing adverse effects. Many treatments entail adverse effects, and we expected that more participants would ascribe symptoms to medications. The level of reported adverse effects could indicate that some patients do not associate symptoms they are experiencing with their medications. However, the part of patients reporting adverse effects is consistent with results from other studies using the PATD questionnaire.^{8,9}

Most participants reported that they would like to withdraw one or more of their drugs if their doctor told them that they could do so. Half of the participants preferred that deprescribing one or more of their drugs would be followed by a consultation with a healthcare professional, and the other half of the participants would have liked post or e-mail follow-up. Less than half of the participants answered that they would be interested in a consultation in a specialised outpatient clinic focusing on polypharmacy. Thus, it seems important that patients trust the healthcare provider who conducts the deprescribing consultation. Other studies have identified trust as a core facet of effective therapeutic relationships, particularly for people with chronic illness because of their greater vulnerability, uncertainty regarding outcomes, and increased dependence on healthcare providers over extended periods of time.^{18,19} Thus, trusting healthcare providers and the healthcare system may be a vital strategy for individuals with chronic illness with many prescribed medications. In addition, sufficient consultation time is essential; limited consultation time results in lower trust in patient-physician relationships.²⁰ Our results suggest that some patients may prefer to have medication-related issues followed by their general practitioners, whereas others may prefer to be followed by outpatient specialists with whom they have good relationships.

Our results from a Danish outpatient population are consistent with previous studies using the PATD questionnaire among older

TABLE 3 Responses to PATD items 11-14, n (%)

	Response options	N = 100
11. Have you ever tried to stop a regular medication with the approval of your doctor?	No	56 (56)
	Yes, and I never took it again	16 (16)
	Yes, but I had to start taking it again	8 (8)
	Yes, but I had to take a different medicine	17 (17)
12. How many different tablets or capsules would you be comfortable taking per day?	5-10	39 (39)
	10-14	34 (34)
	15-19	11 (11)
	20-25	5 (5)
	>25	1 (1)
13. What is the maximum number of tablets or capsules you would be comfortable taking per day?	 (4)	37 (37)
	 (8)	25 (25)
	 (12)	7 (7)
	 (16)	2 (2)
	 (20)	2 (2)
	 (24)	6 (6)
14. If one of your regular medications were stopped, what follow-up would you like?	Face-to-face appointment	67 (67)
	Telephone call	19 (19)
	Written information sent by post	25 (25)
	Written information sent by email	23 (23)
	Contact with a health practitioner when necessary without prescheduled follow-up	8 (8)

PATD, Patients' Attitudes Towards Deprescribing.

inpatients in Italy and Australia.⁹⁻¹¹ Galazzi et al.⁸ also reported that the majority of study participants felt comfortable with the number of medications they were taking. However, in these studies patients were taking a median of six medications, compared to the median of 12 in our cohort. When using visual cues, the majority of participants in the Italian cohort reported that they would be comfortable taking a maximum of four tablets or capsules per day. This is similar to our findings that visual cues led to a majority of participants reporting that they would be comfortable taking fewer medications than they were.

Limitations of the study entail that the number of study participants were limited and recruited from selected outpatient clinics (ie, endocrine and respiratory outpatient clinics in one hospital) and several eligible individuals were unable to participate for reasons that included illness and fatigue. Consequently, the study population may include healthier individuals than are representative of the entire

Danish older outpatient population with excessive polypharmacy. Thus, using sampling strategies to ensure that the population included individuals from different part of the country and whose health status and disease pattern was representative of the larger population may have impacted the results. Another limitation of the study is the lack of knowledge about the appropriateness of the medication in question as well as the focus of the number of tablets in the PATD instrument. Medication is typically not deprescribed just to avoid tablets, but instead to improve medication appropriateness and reduce adverse effects and interactions. Clearly, it is possible that a medical professional relation with the patient including having knowledge of present and previous conditions as well as the degree of inappropriate prescribing in the individual patient may impact the patients attitudes toward deprescribing. Nevertheless, we believe that items used in the PATD instrument provides general indication of older multimorbid patients' attitudes toward medication and

deprescribing. A notion that is supported by the similarity of our result with those of similar studies using PATD in other countries.

In conclusion, our survey suggests that multimorbid outpatients with excessive polypharmacy in Denmark trust their prescribers and feel that their pharmacotherapy is necessary and has very few or no side effects. Paradoxically, many participants would have liked to reduce the number of their medications, and almost half would have liked to be invited to a specialized outpatient clinic focusing on polypharmacy. Our findings emphasize the need for healthcare providers to offer medication reviews and provide systematic follow-up afterward; most patients trust their healthcare providers and cannot be expected to request a medication review.

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REFERENCES

- Schiøtz ML, Høst D, Christensen MB, et al. Quality of care for people with multimorbidity – a case series. *BMC Health Serv Res.* 2017;17:745.
- Maher RL, Hanlon J, Hajjar ER. Clinical consequences of polypharmacy in elderly. *Expert Opin Drug Saf.* 2014;13:57-65.
- Saastamoinen LK, Verho J. Register-based indicators for potentially inappropriate medication in high-cost patients with excessive polypharmacy. *Pharmacoepidemiol Drug Saf.* 2015;24:610-618.
- Masnoon N, Shakib S, Kalisch-Ellett C, Caughey GE. What is polypharmacy? A systematic review of definitions. *BMC Geriatrics.* 2017;17:230.
- Wahab MS, Nyfort-Hansen K, Kowalski SR. Inappropriate prescribing in hospitalised Australian elderly as determined by the STOPP criteria. *Int J Clin Pharm.* 2012;34:855-862.
- Lau DT, Kasper JD, Potter DE, Lyles A, Bennett RG. Hospitalization and death associated with potentially inappropriate medication prescriptions among elderly nursing home residents. *Arch Intern Med.* 2005;165:68-74.
- Reeve E, Shakib S, Hendrix I, Roberts MS, Wiese MD. Development and validation of the patients' attitudes towards deprescribing (PATD) questionnaire. *Int J Clin Pharm.* 2013;35:51-56.
- Galazzi A, Lusignani M, Chiarelli MT, et al. Attitudes toward polypharmacy and medication withdrawal among older inpatients in Italy. *Int J Clin Pharm.* 2016;38:454-461.
- Reeve E, Wiese MD, Hendrix I, Roberts MS, Shakib S. People's attitudes, beliefs, and experiences regarding polypharmacy and willingness to Deprescribe. *J Am Geriatr Soc.* 2013;61:1508-1514.
- Qi K, Reeve E, Hilmer SN, Pearson SA, Matthews S, Gnjdic D. Older peoples' attitudes regarding polypharmacy, statin use and willingness to have statins deprescribed in Australia. *Int J Clin Pharm.* 2015;37:949-957.
- Kalogianis MJ, Wimmer BC, Turner JP, et al. Are residents of aged care facilities willing to have their medications deprescribed? *Res Social Adm Pharm.* 2016;12:784-788.
- Reeve E, Low LF, Hilmer SN. Beliefs and attitudes of older adults and carers about deprescribing of medications: a qualitative focus group study. *Br J Gen Pract.* 2016;66:e552-e560.
- http://www.who.int/substance_abuse/research_tools/translation/en/ November 2017
- Olejaz M, Juul Nielsen A, Rudkjøbing A, Okkels Birk H, Krasnik A, Hernandez-Quevedo C. Denmark health system review. *Health Syst Transit.* 2012;14:1-192.
- Maindal HT, Kayser L, Nørgaard O, Bo A, Elsworth GR, Osborne R. Cultural adaptation and validation of the Health Literacy Questionnaire (HLQ): robust nine-dimension Danish language confirmatory factor model. *Springerplus.* 2016;5:1232.
- Robinson KM, Lau CL, Jeppesen M, Vind AB, Glümer C. Kroniske sygdomme - hvordan opgøres kroniske sygdomme (in English: Chronic Conditions - How to assess Chronic Conditions). The Danish Capital Region 2011.
- Fick DM, Cooper JW, Wade WE, Waller JL, Maclean JR, Beers MH. Updating the Beers criteria for potentially inappropriate medication use in older adults: results of a US consensus panel of experts. *Arch Intern Med.* 2003;163:2716-2724.
- <http://www.emeraldinsight.com/doi/abs/10.1108/14777260610701759/November2017>
- Calnan M, Rowe R. Trust and health. *Sociology Compass.* 2007;1:283-308.
- Keating NL, Green DC, Kao AC, Gazmararian JA, Wu VY, Cleary PD. How are patients' specific ambulatory care experiences related to trust, satisfaction, and considering changing physicians? *J Gen Intern Med.* 2002;17:29-39.

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