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Review

Consumer Attitudes Towards Deprescribing: A Systematic Review and Meta-Analysis

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Abstract

Background: Harmful and/or unnecessary medication use in older adults is common. This indicates deprescribing (supervised withdrawal of inappropriate medicines) is not happening as often as it should. This study aimed to synthesize the results of the Patients' Attitudes Towards Deprescribing (PATD) questionnaire (and revised versions).

Methods: Databases were searched from January 2013 to March 2020. Google Scholar was used for citation searching of the development and validation manuscripts to identify original research using the validated PATD, revised PATD (older adult and caregiver versions), and the version for people with cognitive impairment (rPATDcog). Two authors extracted data independently. A meta-analysis of proportions (random-effects model) was conducted with subgroup meta-analyses for setting and population. The primary outcome was the question: "If my doctor said it was possible, I would be willing to stop one or more of my medicines." Secondary outcomes were associations between participant characteristics and primary outcome and other (r)PATD results.

Results: We included 46 articles describing 40 studies (n = 10,816 participants). The meta-analysis found the proportion of participants who agreed or strongly agreed with this statement was 84% (95% CI 81%–88%) and 80% (95% CI 74%–86%) in patients and caregivers, respectively, with significant heterogeneity (I^2 = 95% and 77%).

Conclusion: Consumers reported willingness to have a medication deprescribed although results should be interpreted with caution due to heterogeneity. The findings from this study moves toward understanding attitudes toward deprescribing, which could increase the discussion and uptake of deprescribing recommendations in clinical practice.

Keywords: Caregivers, Inappropriate prescribing, Medications, Older adults, Polypharmacy

Internationally, there has been focus on the increasing prevalence and harms of multiple medication use in the older population (1). As people age, there may be changes in medical conditions and other medications, as well as a change in their preferences and treatment goals, which can shift medications toward an unfavorable benefit to risk ratio (2). A medication is considered inappropriate when potential harms outweigh potential benefits in the individual (3). An American study of older veterans (n = 462,405) found that 50% were dispensed one or more potentially inappropriate medications (4). The use of potentially inappropriate medi-

cations in older adults increases the risk of adverse drug reactions, functional impairment (5), hospitalization, and mortality (3,6–8). This places a high burden on older adults and health care systems due to associated costs (9,10). This highlights the need for deprescribing, which has been defined as the *process of withdrawal of an inappropriate medication, supervised by a health care professional with the goal of managing polypharmacy and improving outcomes* (11).

Systematic reviews of randomized controlled trials assessing the effectiveness of deprescribing interventions showed that deprescribing is feasible and safe to implement in a research setting (12,13). To implement deprescribing in "real life" clinical practice, it is essential to understand the barriers and enablers for deprescribing. Clinicians commonly report consumers (patients and their caregivers) as being resistant to deprescribing, and patients can have internally contradictory beliefs in that they perceive all their medications are necessary but also want to take fewer (14–16).

The most frequently used patient questionnaires for the assessment of self-reported attitudes toward deprescribing is the Patients' Attitudes Towards Deprescribing (PATD) questionnaire (17). It was developed in 2013 as an exploratory research tool and revised with versions for older adults, caregivers, and people with cognitive impairment (rPATD (18) and rPATDcog) (19). This manuscript uses "(r)PATD" to denote all versions of the questionnaire. The original PATD underwent face, content, criterion, internal validity, and sensitivity and reliability testing. The questionnaire was then revised due to limitations of the original PATD (designed to be exploratory, no scoring ability, limited scope of potential barriers and enablers) and to simultaneously develop a version for informal caregivers. The rPATD underwent face, construct, content, criterion-related validity testing, internal consistency (Chronbach's $\alpha > .65$ for all factors), and test–retest consistency (gamma values between 0.57 and 0.89, $p < .00$ for factor scores). The rPATDcog was adapted from the older adult's version of the rPATD, including shortening the questionnaire and simplifying the wording and response options, making it researcher/clinician administered (rather than self-administered), and conducting face validity. The retained questions were those with the greatest item-to-total correlation to the overall factor score. (r)PATD has been used internationally in multiple research studies with variable findings. Substantial differences exist between the published studies using the (r)PATD in terms of population, method of measurement, and associations with participant characteristics.

The aims of this systematic review were (i) to determine the willingness of adults, caregivers, and people living with cognitive impairment to have a medication deprescribed; (ii) to describe the participant characteristics associated with willingness to have a medication deprescribed; and (iii) to report the attitudes and beliefs of adults and caregivers about their medications and deprescribing as reported through use of the (r)PATD.

Method

We followed the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA). The protocol was preregistered in PROSPERO (CRD42020150007).

Inclusion and Exclusion Criteria

Studies were eligible if they were original studies that enrolled adults (>18 years) with any medical condition taking at least one medication or caregivers of such adults. All study types and settings were included if one or more of the questionnaires of interest were administered and quantitative results captured. No language or other limits were applied.

Search

Medline via Ovid, EMBASE, Scopus, International Pharmaceutical Abstracts, and Web of Science core collections for conference abstracts were searched from the date of first publication of the original PATD manuscript, January 2013, to March 2020. Google Scholar was used for citation searching of the development and validation manuscripts of the (r)PATD questionnaires (17–19). We emailed anyone who had contacted the primary author of the (r)PATD (ER) for permission to use the questionnaires to identify gray literature.

Title/abstract and full text screening was conducted independently by 2 researchers. Disagreements were resolved by discussion.

Data Extraction

Data extracted independently by 2 authors using a standardized form included author, year of publication, study setting, design, participant characteristics, self-reported attitudes toward deprescribing ((r)PATD), and associations between willingness to deprescribe and participants' characteristics. Modifications to any (r)PATD questions and details regarding translations were captured. Studies written in a language other than English were translated using a professional translation service. Corresponding authors were contacted when the primary outcome was not clearly reported.

Two authors independently assessed the quality of reporting using the SUrvey Reporting GuidelinE (SURGE) (20) (modified slightly for the purposes of this review).

Outcomes

The primary outcome of interest was self-reported willingness to have a medication deprescribed, defined as the proportion of participants who responded "agree" or "strongly agree" to "Would you be willing to have one or more of your medicines stopped if your doctor said it was possible?" A version of this question is present in all versions of the (r)PATD. Secondary outcomes were associations between the primary outcome and participant characteristics and other (r)PATD results.

Analysis

For the primary outcome, a random-effects meta-analysis of proportions using the restricted maximum likelihood method was performed in R v3.5.1 using the "meta" package. The proportion was recalculated from the relevant numerator (number who responded agree or strongly agree) and denominator (number who responded to the questionnaire). Proportions were transformed for meta-analysis via the Freeman–Tukey double arsine function to normalize distributions. Funnel plots were used to identify publication bias by plotting the proportion against the standard error and sample size.

To investigate heterogeneity, we performed analyses of predefined subgroups based on study setting, population, survey administration, and peer-reviewed status.

Secondary outcomes were synthesized and presented narratively. Caregiver and rPATDcog results are presented separately.

Table 1. Study and Participant Characteristics

Source, Year, Country	Sample Size, Study Design	Study Population	Age, Years (Median)	Female %	Number of Medications (Median)	Translated, Language	Questionnaire Modified, How
PATD questionnaire							
Anderson et al., 2020 (21,22), Australia	78, pragmatic controlled, pre-post, mixed methods study	Community setting, aged 65+ y, taking ≥5 medications	74	59	8	N	Y, only first 10 questions reported
Aoki et al., 2019 (60), Japan	1483, cross-sectional survey	Outpatient, adults aged 18+ y, taking ≥1 medication	NR	49	NR	N	N
Candela et al., 2019 (thesis) (59), Spain	210, cross-sectional survey	Outpatient, adults aged 18+ y, HIV-positive patients on antiretroviral therapy	51	23	5	Y, Spanish	Y, translated
Cross et al., 2020 (23), Australia	50, feasibility study, pre-post intervention study	Outpatient, patients at risk of a medication-related problem	81	36	11	N	Y, only first 10 questions reported
Frankowski et al., 2019 (48), Netherlands	47, observational descriptive study	Geriatric psychiatry residential ward, taking ≥5 medications	67	51	11	Y*, Dutch	Y, deleted Q8, Q14 and Q15
Galazzi et al., 2016 (58), Italy	100, cross-sectional survey	Hospital setting, aged 65+ y	79	47	6	Y, Italian	Y, translated and deleted Q14
Gillespie et al., 2019 (24), Australia	137, cross-sectional survey	Community setting, aged 65+ y, taking ≥5 medications	76	61	7	N	Y, deleted Q14 and Q15
Goulding unpublished (38), United States	75, pre-post intervention study	Community setting, patients with serious mental illness enrolled in a medication adherence program	60‡	56	NR	N	N
Hao et al., 2018 (33), Malaysia	222, cross-sectional survey	Community setting, aged 65+ y, taking ≥5 medications	70	58	6	NR	Y, Q11 modified
Hendrix et al., 2019 (26), Australia	383, cross-sectional survey	Residential aged care facility, aged 65+ y	88‡	76	10	N	N
Kalogianis et al., 2016 (27), Australia	232, cross-sectional survey	Residential aged care facility, aged 65+ y	87‡	76	15†,‡	N	Y, minor wording changes to allow for interviewer administered
Ng et al., 2017 (53), Singapore	136, cross-sectional survey	Outpatient health care centers, adults aged 45+ y, taking ≥5 medications	68	41	6	N	NR
Qi et al., 2015 (29), Australia	180, cross-sectional survey	Hospital setting, aged 65+ y, taking a statin medication	78	47	8/10§	N	Y, 5 statin specific questions added
Reeve et al., 2014 (thesis) (30),‖ Australia	77, cross-sectional survey	Community pharmacies, adults aged 18+ y, taking ≥1 medication	69	51	5	N	Y, Q11 was not used
Reeve et al., 2013 (PATD development + results) (17,32), Australia	100, development of a questionnaire, cross-sectional survey	Outpatients, adults aged 18+ y, taking ≥1 medication	72	55	10	N	N
Saraswathy et al., 2018 (57),¶ India	257, observational study	Residential aged care facility	NR	48	NR	NR	NR

Table 1. Continued

Source, Year, Country	Sample Size, Study Design	Study Population	Age, Years (Median)	Female %	Number of Medications (Median)	Translated, Language	Questionnaire Modified, How
Schiøtz et al., 2018 (51), Denmark	100, cross-sectional survey	Outpatient clinics, aged 65+ y, taking ≥10 medications	75	63	12	Y, Danish	Y, translated and Q9 modified
Sirois et al., 2017 (43), Canada	129, cross-sectional survey	Community setting, aged 65+ y, taking ≥1 medication	76	63	6	Y, French	Y, translated. 2 questions added about nurse involvement and follow-up for deprescribing
Turner et al., 2018 (44), Canada	489, secondary analysis of a randomized controlled trial	Community setting, aged 65+ y, taking ≥1 medication, taking specific medication	75‡	66	9‡	N	Y, only first 10 questions reported
ul Haq et al., 2016 (61)·¶ Pakistan	207, cross-sectional survey	Hospitals and community pharmacies	NR	NR	NR	NR	NR
Van Marum et al., 2016 (49), Netherlands	40, interview and cross-sectional survey	Community setting, older adults aged 70+ y, taking ≥7 medications	79	55	11‡	Y, Dutch	Y, translated. Deleted Q8, Q14 and Q15
Whitty et al., 2018 (45), Canada	53, pilot study	Hospital setting, seriously ill or frail older patients	80‡	43	13‡	NR	Y, Q11 response items changed to 2-point scale (Yes and No), deleted Q12 and Q13
rPATD, rPATDcog questionnaires							
Cardwell et al., 2020 (62), Ireland	786, non-randomized pilot study	Community setting, aged 65+ y, taking ≥10 medications	70‡	65	10‡	N	N
Edelman et al., 2019 (46,47), The Netherlands	179, cross-sectional survey	Community setting, men aged 30+ y, taking an alpha-blocker, diagnosed with lower urinary tract symptoms	69‡	0	4	Y, Dutch	Y, translated. Modified questions to create alpha-blocker-specific rPATD factors
Gnjidic et al., 2019 (25), Australia	42, feasibility study	Hospital setting, aged 65+ y, taking a benzodiazepine	72	55	10	N	Y, 5 benzodiazepine-specific questions were added
Ikeji et al., 2019 (39,40), United States	19, cross-sectional survey	Outpatient, aged 65+ y, taking a Proton Pump Inhibitor	NR	60	NR	N	Y, the questionnaire was modified to focus on proton pump inhibitors
Kua C-H et al., 2020 (52), Singapore	615, cross-sectional survey	Hospitals, community pharmacies and primary care clinics, aged 65+ y, taking ≥1 medication. Caregivers	73‡	44	5‡	N	N
Kua K et al., 2019 (34,35,63), Malaysia	502, cross-sectional survey	Community pharmacies and primary care clinics, aged 60+ y, taking ≥1 medication. Caregivers	67	50	3	Y, Mandarin and Malay	Y, translated
Lundby et al., 2019 (50),¶ Denmark	159, validation study and cross-sectional survey	Residential aged care facility	82	61	NR	Y, Danish	Y, translated
Major et al., 2019 (28),# Australia	66, intervention study and survey	Community setting	NR	NR	12‡	N	Y, Q7 (primary outcome) was not asked
Martinez et al., 2020 (41), United States	30, pre-post intervention study	Community setting, adults aged 18+ y, with insomnia	56‡	100	4‡	N	NR
Ng et al., 2019,(36),¶ Malaysia¶	18, cross-sectional survey	Community setting, adults aged 18+ y, diagnosed with Parkinson's disease	64	44	5**	NR	NR
Nusair et al., 2020 (54), Jordan	358, validation study and survey	Outpatient, adults aged 18+ y, taking ≥5 medications	60‡	52	7‡	Y, Arabic	Y, translated

Source, Year, Country	Sample Size, Study Design	Study Population	Age, Years (Median)	Female %	Number of Medications (Median)	Translated, Language	Questionnaire Modified, How
Omar et al., 2019 (37), Malaysia	182, cross-sectional survey	Primary care clinics, aged 65+ y, taking ≥1 medication	72	52	6	Y, Malay	Y, translated
Paque et al., 2019 (55), Belgium	296, cross-sectional survey	Residential aged care facility, aged 65+ y, limited life expectancy. Caregivers	86‡	74	7‡	Y, Dutch	Y, translated and added a question about patients' willingness to speak to their GP about their medications
Reeve et al., 2019 (rPATD development and results) (18,31), Australia	386, cross-sectional survey	Community setting, aged 65+ y, taking ≥1 medication. Caregivers	74	57	NR	N	N
Reeve et al., 2018 (42),†† United States	1981, cross-sectional survey	Community setting, aged 65+ y	NR	55	NR	N	Y, combined 10 questions from the PATD and rPATD (older adults' version),modified to a 4-point Likert scale (deleted unsure)
Reeve et al., 2018 (rPATDcog) (19), Australia	21, development and pilot study of the rPATDcog	Outpatient, adults aged 18+ y, taking ≥1 medication, with a diagnosis of mild cognitive impairment or dementia. Caregivers	77‡	48	7‡	N	Y, the rPATD questionnaire for older adults was used to develop the rPATDcog questionnaire
Scott et al., 2019 (63), United Kingdom	75, cross-sectional survey	Hospital setting, aged 70+ y, with physical frailty or comorbidities. Caregivers	87	45	8	N	Y, Q10 minor changes to fit the UK context regarding cost of medicines
Tegegn et al., 2018 (56), Ethiopia	316, cross-sectional survey	Outpatient, aged 65+ y, taking ≥1 medication	70	45	3	Y, Amharic	Y, translated and modified to a 4-point Likert scale (deleted unsure)

Notes:

*Implied in the article: a translated questionnaire was based on comparative research (van Marum et al. (49)).

†Regular and medications taken as required.

‡Mean.

§Discrepancy in the manuscript text and table.

‖This reference contains results from 2 cohorts; one of these cohorts was published separately (and so are reported separately: Reeve 2013). Data presented here are from the second cohort only (community pharmacy participants).

¶This is an abstract.

#This is an editorial comment.

**Including supplements.

††Combined PATD and rPATD questions, for clarity we have classified this reference as using the rPATD questionnaire.

Table 2. PATD Questionnaire Results

Study	Q1. I Feel That I am Taking a Large Number of Medications	Q2. I am Comfortable With the Number of Medications That I am Taking	Q3. I Believe That All My Medications Are Necessary	Q4. If My Doctor Said It Was Possible, I Would Be Willing to Stop One or More of My Regular Medications	Q5. I Would Like to Reduce the Number of Medications That I am Taking	Q6. I Feel That I May Be Taking One or More Medications That I No Longer Need	Q7. I Would Accept Taking More Medications for My Health Conditions	Q8. I Have a Good Understanding of the Reasons I Was Prescribed Each of My Medications	Q9. Having to Pay for My Medications Would Play a Role in My Willingness to Stop One or More of Them	Q10. I Believe One or More of My Medications Is Giving Me Side Effects
	AGREE % (strongly agree and agree)									
Anderson et al., 2020 (21,22)			60	95		19				29
Aoki et al., 2019 (60)				68						
Candela et al., 2019 (thesis) (59)	41	61	90	82	72	8	71	97	43	21
Cross et al., 2020 (23)	54	86	76	88	62	16	40	74	8	34
Frankowski et al., 2019 (48)	53	70	64	77	51	38	47	49		36
Galazzi et al., 2016 (58)	59	87	78	89	89	12	64	70	15	30
Gillespie et al., 2019 (24)	49	80	80	88	56	18	74	91	20	22
Goulding unpublished (38)	60	76	81	74	41	19	56	86	37	44
Hao et al., 2018 (33)	46	60	80	38	56	12	10	81	34	35
Hendrix et al., 2019 (26)	49	8	75	83	43	18	60	68	15	15
Kalogianis et al., 2016 (27)	40	83	74	79	41	18	56	68	13	11
Ng et al., 2017 (53)	60	82	87	93	73	25	65	93	48	31
Qi et al., 2015 (29)	71	76	85	89	68	24	84	81	19	32
Reeve et al., 2014 (thesis) (30)*	48	71	91	88	66	18	62	95	33	29
Reeve et al., 2013 (PATD development and results) (17,32)	65	69	78	92	68	16	71	90	32	31

Table 2 Continued

Study	Q1. I Feel That I am Taking a Large Number of Medications	Q2. I am Comfortable With the Number of Medications That I am Taking	Q3. I Believe That All My Medications Are Necessary	Q4. If My Doctor Said It Was Possible, I Would Be Willing to Stop One or More of My Regular Medications	Q5. I Would Like to Reduce the Number of Medications That I am Taking	Q6. I Feel That I May Be Taking One or More Medications That I No Longer Need	Q7. I Would Accept Taking More Medications for My Health Conditions	Q8. I Have a Good Understanding of the Reasons I Was Prescribed Each of My Medications	Q9. Having to Pay for My Medications Would Play a Role in My Willingness to Stop One or More of Them	Q10. I Believe One or More of My Medications Is Giving Me Side Effects
	AGREE % (strongly agree and agree)									
Saraswathy et al., 2018 (57)†				49	17				43	
Schiøtz et al., 2018 (51)	81	65	79	85	82	11	71	85	18	40
Sirois et al., 2017 (43)	51	81	84	69	51	22	81	91	33	26
Turner et al., 2018 (44)§	56	85	92	86	66	22	48	97	18	26
ul Haq et al., 2016 (61)†				55						
Van Marum et al., 2016 (49)	68	73	85	98	65	28	60	80		38
Whitty et al., 2018 (45)	61	52	56	91	63	28	69	70	28	43

Notes:

*This reference contains results from 2 cohorts; one of these cohorts was published separately (and so are reported separately: Reeve 2013). Data presented here are from the second cohort only (community pharmacy participants).

†This is an abstract.

§Strongly agree + agree + unsure grouped for questions 2, 3, 7, and 8 in this study.

Not reported
0%–10%
11%–20%
21%–30%
31%–40%
41%–50%
51%–60%
61%–70%
71%–80%
81%–90%
91%–100%

Table 3. Older Adults' Results From the rPATD Questionnaire

	Global	Involvement					Global	Burden					Appropriateness					Concerns About Stopping				
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22
Study	AGREE % (strongly agree and agree)																					
Cardwell et al., 2020 (62)							90															
Edelman, 2019 (46,47)*	79	91					93															
Gnjidic et al., 2019 (25)	93	81	95	88	82	95	88	72	19	22	49	18	43	45	16	38	20	22	40	19	17	3
Kua C-H et al., 2020 (52)	89	61	88	77	84	88	83	46	38	48	46	39	32	50	23	24	15	17	33	27	36	9
Kua K et al., 2019 (34,35,63)	88	64	89	72	84	38	68	34	27	28	34	33	37	48	13	24	14	23	31	33	26	7
Lundby et al., 2019 (50)†	93	100					86	63					44		27							
Major et al., 2019 (28)‡	93	76	59	77	73	49		56	11	38	44	18	32	24	20	23	18	17	50	38	18	11
Martinez et al., 2020 (41)	90	97	100	100	100	100	93		30	43	33	17	33	20	10	13	7	33	40	43	20	3
Ng et al., 2019 (36)†	67																					
Nusair et al., 2020 (54)	79	80	92	74	75	86	90	60	59	41	58	57	34	38	23	43	24	19	27	26	25	15
Paque et al., 2019 (55)	84	46	46	39	77	47	85	36	12	13	20	15	23	25	10	20	15	13	27	19	16	8
Reeve et al., 2019 (rPATD development and results) (18,31)	92	96	97	94	97	96	88	38	16	40	23	10	20	15	12	24	9	16	36	21	15	4
Reeve et al., 2018 (42)§			96				92	43							16				52		16	
Tegegn et al., 2018 (56)	92	60	67	61	81	24	82	51	38	68	36	39	9	42	34	42	90	27	28	89	47	28
Scott et al., 2019 (63)	92	59	80	76	79	76	97	48	16		41	15	29	20	33	28	20	8	37	37	16	16

Notes: Omar et al. (2019) (37): Reported means only.

Q1. Overall, I am satisfied with my current medicines.

Q2. I like to be involved in making decisions about my medicines with my doctors.

Q3. I have a good understanding of the reasons I was prescribed each of my medicines.

Q4. I like to know as much as possible about my medicines.

Q5. I always ask my doctor, pharmacist or other health care professional if there is something I do not understand about my medicines.

Q6. I know exactly what medicines I am currently taking, and/or I keep an up-to-date list of my medicines.

Table 3. Continued

Q7. If my doctor said it was possible, I would be willing to stop one or more of my regular medicines.
Q8. I feel that I am taking a large number of medicines.
Q9. Taking my medicines every day is very inconvenient.
Q10. I spend a lot of money on my medicines.
Q11. Sometimes I think I take too many medicines.
Q12. I feel that my medicines are a burden to me.
Q13. I would like to try stopping one of my medicines to see how I feel without it.
Q14. I would like my doctor to reduce the dose of one or more of my medicines.
Q15. I feel that I may be taking one or more medicines that I no longer need.
Q16. I believe one or more of my medicines may be currently giving me side effects.
Q17. I think one or more of my medicines may not be working.
Q18. I have had a bad experience when stopping a medicine before.
Q19. I would be reluctant to stop a medicine that I had been taking for a long time.
Q20. If one of my medicines was stopped I would be worried about missing out on future benefits.
Q21. I get stressed whenever changes are made to my medicines.
Q22. If my doctor recommended stopping a medicine I would feel that he/she was giving up on me.
*Mostly reported factor scores.
†This is an abstract.
‡This is an editorial comment.
§Combined PATD and rPATD questions, for clarity we have classified this reference as using the rPATD questionnaire.

Not reported
0%–10%
11%–20%
21%–30%
31%–40%
41%–50%
51%–60%
61%–70%
71%–80%
81%–90%
91%–100%

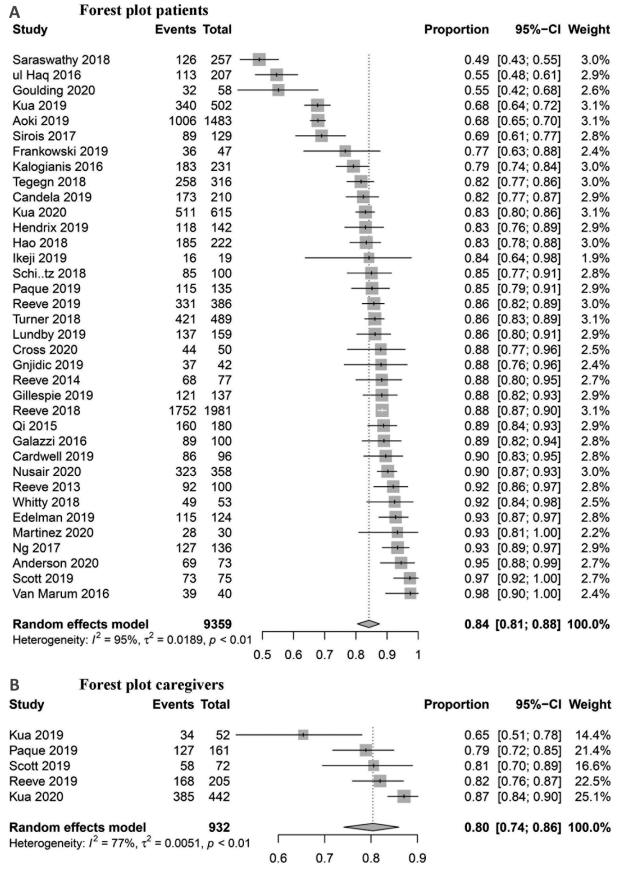

Figure 1. Forest plots of proportion of participants who agreed or strongly agreed with the question "If my doctor said it was possible, I would be willing to stop one or more of my medicines". (A) Forest plot patients. (B) Forest plot caregivers.

Results

Study Characteristics

We identified and included 40 eligible studies reported in 46 articles (Supplementary Figure 1).

Sample sizes ranged from 18 to 1981 participants with a total of 10,816 participants (Table 1). The studies were conducted in Australia (n = 12) (17–19,21–32), Malaysia (n = 4) (33–37), the United States (n = 4) (38–42), Canada (n = 3) (43–45), the Netherlands (n = 3) (46–49), Denmark (n = 2) (50,51), Singapore (n = 2) (52,53), Jordan (54), Belgium (55), Ethiopia (56), India (57), Italy (58), Spain (59), Japan (60), Pakistan (61), Ireland (62), and the United Kingdom (63) (one each). Twenty-two studies used the original PATD (17,21–24,26,27,29,30,32,33,38,43–45,48,49,51,53,57–61), 17 used the older adults version of the rPATD (18,25,28,31,34–37,39–42,46,47,50,52,54–56,62,63), and 1 used the rPATDcog (19). Six studies that used the rPATD/rPATDcog also used the caregiver version of the rPATD (19,31,34,35,52,55,63). Most studies used the (r)PATD questionnaires specifically for measuring attitudes in a cross-sectional study. However, some studies (n = 4) (21,22,41,44,62) used the questionnaires as a baseline and/or outcome measure in a deprescribing intervention study. More than half of the 40 studies (n = 24, 60%) (18,19,21,22,24–27,29,31,33,39,40,43–45,48–52,55–58,62,63) focused on older adults. The median age of participants included in the studies ranged from 51 to 87 years old. Seventeen (43%) studies (18,21,22,24,30,31,33–35,38,41–44,46,47,49,52,53,61,62) were conducted in the community or primary care setting, 9 (23%) in the hospital setting (17,25,29,32,45,52,58,61,63), and 8 (20%) (19,23,39,40,53,54,56,59,60) in the outpatient setting. Six studies translated the PATD (43,48,49,51,58,59), and 7 studies translated the rPATD (34,35,37,46,47,50,54–56); 13 studies in total (Supplementary Table S2). Four studies used medication-specific questions in adapted (r)PATD questionnaires on statins (29), alpha-blockers (46,47), benzodiazepines (25), and proton pump inhibitors (Supplementary Table S3) (39,40).

Regarding the quality of reporting, all studies described or partially described the questionnaire used (100%, 38/38) and most referenced the original work (95%, 36/38; see Supplementary Tables 4 and 5). Assessment of quality reporting was unable to be performed on 2 of the studies (38,59). Most studies gave a description of the desired population (89%, 34/38), 79% (30/38) reported how the survey was administered, and 74% (28/38) at least partially reported the psychometric properties of the (r)PATD. However, 26 studies (68%) did not report the format of the survey (paper, online, or both) and half (19/38) did not present a sample size calculation or justification of sample size.

Willingness to Have a Medication Deprescribed

Overall, 49%–98% (n = 36 studies) of patients in the included studies were willing to stop 1 or more of their medications if their doctor said it was possible (Tables 2 and 3). Three studies did not report the results to this question as a proportion. From the rPATDcog (n = 1), 82% of patients (with cognitive impairment) were willing to have a medication deprescribed if their doctor said it was possible (19). Our meta-analysis showed the pooled proportion was 84% (95% CI 81%–88%, I^2 = 95%) of patients who responded "agree" or "strongly agree" to the question: "Would you be willing to have one or more of your medicines stopped if your doctor said it was possible?" (Figure 1). There was significant heterogeneity overall and the subgroup analyses (Supplementary Figure 2) were not able to explain the heterogeneity. We found limited evidence of publication bias based on visual inspection of the funnel plots (Supplementary Figure 3).

The majority of caregivers (65%–87%, n = 5 studies) reported that they would be willing for one or more of their care recipient's medications to be stopped if their care recipient's doctor said it was possible (Supplementary Table S6) (19,31,34,35,52,55,63). The pooled effect estimate was 80% (95% CI 74%–86%, I^2 = 77%).

Responses to the (r)PATD Questionnaires

The questions from the PATD which had the smallest ranges of responses (ie, least variation in findings across studies) were "I feel that I may be taking one or more medications that I no longer need" (studies found between 8% and 38% agreement in 32/39 studies (as this question is in both the PATD and rPATD questionnaires), "I believe one or more of my medications is giving me side effects" (11%–44% over 19/22 studies), and "I believe that all my medications are necessary" (56%–92% in 18/22 studies). Although the questions with the greatest variation across studies were "I would like to reduce the number of medications that I am taking" (17%–89% over 18/22 studies) and "I would accept taking more medications for my health conditions" (10%–84% in 17/22 studies; see Table 2).

Studies that used the rPATD questionnaire (Table 3) found that 27%–52% of participants would be reluctant to stop a medicine they had taken for a long time (12/17 studies). Most participants

Table 4. Associations With the Primary Outcome Question "If my doctor said it was possible, I would be willing to stop one or more of my regular medicines"

	Variables (Statistical Significance, Direction of Association)					
Source, Year	Age	Number of Medications	Number of Chronic Health Conditions	Gender (Female)	Education Level	Access Discount Medications* (Yes)
PATD						
Aoki et al., 2019 (60)	S, +	S, +	S, +	NS	NS	/
Gillespie et al., 2019 (24)	/	NS	/	/	/	/
Hao et al., 2018 (33)	S, –	/	/	/	/	/
Kalogianis et al., 2016 (27)	/	NS	/	/	/	/
Qi et al., 2015 (29)	NS	NS	/	/	/	/
Reeve et al., 2013 (PATD development + results) (17,32)	NS	NS	NS	/	/	S, –
Reeve et al., 2014 (thesis) (30)†	NS	NS	/	/	/	/
ul Haq et al., 2016 (61)	S, +	NS	/	/	/	NS
rPATD						
Kua C-H et al., 2020 (52)	NS	S‡	/	NS	NS	/
Kua K et al., 2019 (34)	S, +	NS	/	NS	S, –	/
Ng et al., 2017 (53)	S, –	/	/	/	/	/
Reeve et al., 2019 (rPATD results) (18,31)	NS	NS	/	NS	NS	S, +
Reeve et al., 2018 (42)	NS	S, +	S, +	NS	NS	NS
Tegegn et al., 2018 (56)	NS	/	NS§	NS	NS	/
Total examined	11	10	4	6	5	4
Total significant	5	3	2	0	1	2

Notes: / = not examined; NS = not significant; S = significant. "+" denotes increasing/higher variable (or female gender or possession of a medication concession card) associated with increasing willingness to deprescribe. "–" denotes decreasing/lower variable (or male gender or no medication concession card) associated with increasing willingness to deprescribe.

*Participants had a medication concession card or drug cost was covered/fully subsidised.

†This reference contains results from 2 cohorts; one of these cohorts was published separately (and so are reported separately: Reeve 2013). Data presented here are from the second cohort only (community pharmacy participants).

‡Unclear if the direction of the finding is "+" or "–" ; significant difference was found between groups (1–5, 6–10, and >10), but authors report "No significant differences in sub-group analysis."

§Charlson Comorbidity Index.

(67%–93%) reported they were satisfied with their current medicines (12/17 studies), whereas 24%–100% of participants felt that they knew exactly which medicines they take and/or have an up-to-date list (12/17 studies) and 7%–90% of participants felt that one or more of their medicines may not be working (11/17 studies). In response to the statement: "I would like to try stopping one of my medicines to see how I feel without it," 9%–44% of participants agreed (14/17; see Table 3).

Findings of the caregivers' version of the rPATD are presented in Supplementary Table S6.

Associations Between Participant Characteristics and Willingness to Have a Medication Deprescribed

Fourteen studies examined relationships between participant characteristics and the primary outcome willingness to have a medication deprescribed (Table 4 and Supplementary Table S7). The most common patient characteristics examined were age (n = 12), gender (n = 6), education level (n = 6), number of medications (n = 11), and chronic health conditions (n = 4). Five of 12 studies reported a significant association between age and willingness to have a medication deprescribed, although the direction of this association varied (eg, older age compared with younger age were both found to be associated with greater willingness to have a medication deprescribed). Three studies examined relationships between caregiver characteristics and the primary outcome willingness to have a medication deprescribed (Supplementary Table S8).

Discussion

Main Findings

We synthesized results of 40 studies that used the (r)PATD questionnaires. The included studies were diverse in study design, intended purpose, and characteristics examined. Overall, many participants were willing to have a medication deprescribed if their doctor said it was possible (84%, 95% CI 81%–88%). Caregiver data provided a similar result, 80% (95% CI 74%–86%). However, there was significant heterogeneity (I^2 = 95% patients, 77% for carers) and no explanation for this was identified through the subgroup analyses. Approximately one third of the studies examined associations between participant characteristics and the primary outcome. However, there was inconsistency in whether there was statistical significance between characteristics and the primary outcome. In the studies where there was an association found, there was inconsistency in the direction of the association (ie, if the characteristic was associated with higher or lower willingness). As such, it is still unclear whether individual characteristics (such as age or number of medications) could predict participant willingness to have their medications deprescribed.

Strengths and Limitations

A strength of this review is that we included articles published in any language, conference abstracts, and gray literature. We identified unpublished (or locally published) articles/reports through contacting those who had requested permission to use the (r)PATD. Our multipronged search strategy, which included methods outside of traditional database searching, led to additional studies being included. Studies within the review were diverse in terms of setting, country, and design. Most studies in this review were from high-income countries, which may reflect missing studies, or that studies have not been done in these lower income countries. Few studies examined caregivers' attitudes, and only a single study used the rPATDcog.

Many of the included studies were cross-sectional and as such do not allow conclusions on causality (when examining the associations between participant characteristics and willingness to deprescribe). The (r)PATD, as a self-reported measure, is susceptible to social desirability bias. Although no difference was found in the subanalysis looking at method of administration (self-report, researcher administered) and several studies collected responses anonymously. Convenience samples were used in several studies; representativeness of the sample was described as one of the limitations in many of the included articles, and how nonrespondents differed from participants was rarely described. Overall, participants may have been healthier or more involved in managing their medications, particularly in studies of self-selected participants. One U.S. study (42) was conducted in a representative population and several studies targeted disadvantaged populations (38,41,48) without any obvious differences in (r)PATD responses in these studies.

A checklist to assess the quality of reporting was used in place of a risk of bias tool (20). Such reporting checklists do not technically assess a study's quality; however, no quality assessment tool was identified for surveys. The sections that were generally well reported included background, discussion, and ethics, whereas methods and results were less well reported. The studies within this review were somewhat heterogeneous, including how the (r)PATD was used. Although a number of translations have been published, it is unclear if they are all semantically equivalent to the English version. There was variation in the use of items and response scales, and few of the studies that modified the (r)PATD reported validation for their local context. However, most translated versions of the (r)PATD involved some piloting (5–28 patients), and modified questions were often reviewed by the research team. It is possible that cultural or country-specific differences exist in relation to patients' attitudes toward deprescribing that may affect responses to the (r)PATD.

Comparison With Other Studies

There is an increasing understanding that medication optimization can be achieved by engaging older adults and their caregivers in deprescribing decisions and prioritizing patient-centered care. The synthesized results from this review can be interpreted in the context of findings using complementary surveys. The Patient Perceptions of Deprescribing (PPoD) survey (64,65) found that one third of participants (34%, n = 803) had experienced stopping a medication. Significant factors associated with past deprescribing experience included being told by a doctor or the patient asking to stop a medication, interest in deprescribing, shared decision making, and higher education. Alternatively, factors associated with decreased likelihood to deprescribe included polypharmacy and participants having higher trust in their doctor.

Qualitative findings of patient-related barriers to deprescribing (66,67) recognize the often coexisting positive and negative attitudes toward deprescribing that patients have, as well as the complex interplay that exists between attitudes, beliefs, and decision making. The (r)PATD results reflect these seemingly contradictory attitudes in that individuals may say they are open to deprescribing but also report high satisfaction with their medications. Indeed, qualitative findings show clinicians perceive their patients are reluctant to deprescribe medications (68,69). Additionally, in previous studies, 30%–40% of participants have refused to participate in a deprescribing intervention study (70–72), irrespective of taking potentially inappropriate medications (73). Presently, the predictive ability of the (r)PATD has not been established, and it may be difficult to discriminate patient behavior from hypothetical willingness to deprescribe. Additionally, even though participants in the included studies overwhelmingly report agreement with deprescribing if their doctor said it was possible, the factors influencing acceptance of deprescribing in clinical practice at a single point in time are complex and multifaceted (74).

Research, Clinical, and Policy Implications

We found inconsistency in the participant characteristics that were associated with willingness to deprescribe. Understanding predictors of positive attitudes toward deprescribing more generally could enable tailored deprescribing practices as singular, external, or measurable factors might not consistently predict attitudes to deprescribing. There were some participant characteristics, such as frailty and dementia, that were only captured in a few studies or were measured in different ways. This highlights the need to consistently measure characteristics to add to the evidence base, particularly for these patients that stand to benefit the most from deprescribing (75). Deprescribing is a process that should involve the patient (76), therefore, an ongoing conversation with the patient and caregiver, and consideration of the complex internal and external factors that affect the implementation of deprescribing is required (77).

Although mostly used in the research setting, the (r)PATD is increasingly used as part of a deprescribing intervention strategy, such as the Australian G-MEDSS (Goal-directed Medication Review Electronic Decision Support System) study (78,79) and the US OPTIMISE study (80,81). This highlights a shift toward implementation of self-assessment surveys in clinical practice to promote "real-time" support for deprescribing conversations. Further work is required to determine how and when the (r)PATD can be best utilized in clinical practice.

Different public health and policy initiatives may be implemented to increase deprescribing activities. For instance, raising public awareness and acceptance of deprescribing as a normal and positive part of patient care may alleviate concerns patients may have to trial stopping a medication (this review found between 27% and 52% of participants were reluctant to stop a long-term medication) (82). Additionally, it is important to prioritize shared decision making (76) with a focus on patients' goals and preferences, to navigate the seemingly contradictory beliefs of willingness to deprescribe yet feeling that their medications are appropriate. Remuneration and dedicated clinical consultations for these discussions may be needed to increase widespread deprescribing in practice.

Conclusions

Overall, clinicians should be reassured of their patients' and caregivers' willingness to have medications deprescribed. As such, this could encourage clinicians to initiate a conversation about deprescribing with those they care for. The findings from this study moves toward understanding attitudes toward deprescribing, which could, in turn, increase the discussion and uptake of deprescribing recommendations in clinical practice.

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series A: Biological Sciences and Medical Sciences* online.

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Conflict of Interest

Dr. Reeve was the lead author of the development of the PATD, rPATD, and rPATDcog (the questionnaire of interest in this systematic review).

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Author Contributions

All authors were involved in designing the study. K.R.W. and N.J.A. were involved in searching the database. K.R.W. and N.J.A. screened citations for inclusion. K.R.W., E.R., and N.J.A. were involved in extracting data and interpretation. K.R.W. and E.R. synthesized the data, and C.R.S. conducted the meta-analysis. K.R.W. drafted the manuscript, and E.R. and N.J.A. contributed to the drafting of the review. S.N.H. and C.R.S. revised the manuscript critically for important intellectual content. All authors reviewed the final manuscript and agreed to be accountable for all aspects of the work and approved the final manuscript for submission.

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