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RESEARCH PAPER

Preferences for deprescribing antihypertensive medications amongst clinicians, carers and people living with dementia: a discrete choice experiment

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Abstract

Background: Optimal management of hypertension in people with dementia may involve deprescribing antihypertensives. Understanding differing treatment priorities is important to enable patient-centred care. This study explored preferences for antihypertensive deprescribing amongst people living with dementia, carers and clinicians.
Methods: Discrete choice experiments (DCEs) are a stated preference survey method, underpinned by economic theory. A DCE was conducted, and respondents completed 12 labelled choice-questions, each presenting a status quo (continuing antihypertensives) and antihypertensive deprescribing option. The questions included six attributes, including pill burden, and event risks for stroke, myocardial infarction, increased blood pressure, cognitive decline, falls.
Results: Overall, 112 respondents (33 carers, 19 people living with dementia, and 60 clinicians) completed the survey. For people with dementia, lower pill burden increased preferences for deprescribing (odds ratio (OR) 1.95, 95% confidence interval (95% CI) 1.08–3.52). Increased stroke risk (for each additional person out of 100 having a stroke) decreased the likelihood of deprescribing for geriatricians (OR 0.71, 95% CI 0.55–0.92) and non-geriatrician clinicians (OR 0.62, 95% CI 0.45–0.86), and carers (OR 0.71, 95% CI 0.58–0.88). Increased myocardial infarction risk decreased preferences for deprescribing for non-geriatricians (OR 0.81, 95% CI 0.69–0.95) and carers (OR 0.84, 95% CI 0.73–0.98). Avoiding cognitive decline increased preferences for deprescribing for geriatricians (OR 1.17, 95% CI 1.03–1.33) and carers (OR 1.27, 95% CI 1.09–1.48). Avoiding falls increased preferences for deprescribing for clinicians (geriatricians (OR 1.20, 95% CI 1.11–1.29); non-geriatricians (OR 1.16, 95% CI 1.07–1.25)). Other attributes did not significantly influence respondent preferences.
Conclusions: Antihypertensive deprescribing preferences differ amongst people with dementia, carers and clinicians. The study emphasises the importance of shared decision-making within the deprescribing process.

Keywords: deprescribing, dementia, discrete choice experiment, older people, antihypertensive medicines

Key Points

- Optimal management of hypertension in people living with dementia may involve deprescribing antihypertensive medications.
- This is amongst the first discrete choice experiments to explore antihypertensive deprescribing preferences for people with dementia.
- This study demonstrates that stakeholders have different preferences for the potential benefits and harms of deprescribing.
- The study highlights the importance of shared decision-making when deprescribing antihypertensives for people with dementia.

Introduction

Dementia and hypertension often occur concurrently in older people. More than 40% of people living with dementia in the United Kingdom have a diagnosis of hypertension [1, 2]. The prevalence of hypertension amongst people living with dementia has increased in the United States since 2006 [3]. Hypertension is diagnosed in 41% of community-dwelling Australians living with dementia and in 39% of those in residential aged care facilities [4]. More than 70% of care home residents with hypertension are prescribed multiple antihypertensives, which is associated with higher mortality in people with dementia and those who are most frail [5].

Hypertension is a risk factor for premature death, stroke, myocardial infarction, heart failure, cognitive decline and chronic kidney disease; and antihypertensive use decreases these risks in older populations [6]. However, antihypertensive use is associated with orthostatic hypotension, frailty, falls and, in some studies, potential worsening cognition in people with dementia [6, 7]. Antihypertensive adverse drug events include dizziness, syncope, falls and metabolic effects (i.e. hypo- or hyperkalaemia, hyperglycaemia or hyperuricaemia). Antihypertensive use also contributes to polypharmacy, pill burden and the risk of drug interactions [6, 8–10].

Optimal management of hypertension in people living with dementia may require deprescribing antihypertensive medications if the harms outweigh benefits of treatment. There is real-world evidence of these deprescribing patterns in clinical practice [11–13]. Deprescribing refers to the stepwise process, supervised by a healthcare professional, of withdrawing unnecessary or potentially inappropriate medicines after considering the patient's therapeutic goals and treatment benefits and harms [14, 15]. When deprescribing antihypertensives, diminished capability for decision-making and increasing involvement of family and carers with people living with dementia increases the complexity of shared decision-making [16]. The importance of shared decision-making is emphasised in national clinical standards in Australia [17–19] and engaging patients in research can help inform shared decision-making in practice [20].

Previous studies highlighted that people with dementia wanted to participate in clinical decisions, and that various factors influenced patients, carers and healthcare professionals' attitudes towards deprescribing [21–25]. Patients and clinicians may also have different treatment priorities. Discrete choice experiments (DCEs) are increasingly being used in healthcare research as they can provide added preference information, such as identifying how preferences for the benefits and harms of treatment options differ between stakeholders, which can help inform clinical and policy decisions and guidelines [26]. There is a lack of research on preferences of people with dementia and their carers regarding prescribing and deprescribing for hypertension [16].

The objective of this study was to explore preferences for the potential benefits and harms of deprescribing antihypertensives amongst people living with dementia, carers and clinicians.

Methods

Study design

Antihypertensive deprescribing preferences were elicited using a DCE. DCEs are a quantitative method based on Lancaster's theory where goods/services are described as underlying attributes with multiple levels [27]. In DCEs, individuals choose one alternative from the options presented, with each option characterised by a combination of attributes and levels. In this study, respondents chose between the status quo (i.e. antihypertensive continuation) or antihypertensive deprescribing based on levels of the attributes that reflected potential harms or benefits over the next year.

Choices made in DCEs are analysed using random utility theory. This states that when faced with two or more options, people will choose the option that gives them the highest overall utility value [28, 29] and the choices people make reflect their preferences. Using a DCE, we determined which attributes (if any) drove stakeholders' preferences when choosing deprescribing or the status quo prescribing alternative.

The DCE was designed and conducted in accordance with DCE practice guidelines [26, 30–35].

Participants

The DCE included a convenience sample of three self-reported respondent groups: Australian-based people living with dementia and carers of people with dementia (including

Table 1. Summary of DCE attributes and attribute levels [6, 36–41]

	Deprescribing alternative	Status quo alternative (medicines continued)
Attributes	**Levels**	**Fixed levels**
Potential harms of deprescribing antihypertensive medicines over the next year		
1. Risk of stroke	1 out of 100 people	1 out of 100 people
	2 out of 100 people	
	7 out of 100 people	
2. Risk of myocardial infarction	1 out of 100 people	1 out of 100 people
	2 out of 100 people	
	9 out of 100 people	
3. Risk of significant increase in blood pressure	18 out of 100 people	1 out of 100 people
	24 out of 100 people	
	31 out of 100 people	
Potential benefits of deprescribing antihypertensive medicines over the next year		
4. Risk of falls	5 out of 100 people	32 out of 100 people
	11 out of 100 people	
	26 out of 100 people	
5. Risk of noticeable decline in cognitive function	25 out of 100 people	33 out of 100 people
	33 out of 100 people	
	40 out of 100 people	
6. Number tablets taken per day (pill burden)	One less tablet per day	No change in number of tablets per day
	Two less tablets per day	
	Three less tablets per day	

professional and family member carers), and Australian- and non-Australian-based clinicians, within any clinical specialty, who are legally authorised prescribers and treat people with dementia. People living with dementia and carer participants were recruited through patient and carer organisations in Australia. Clinician participants were recruited through Australian and international networks and the professional networks of the study investigators. See Appendix A, Supplementary Material, for additional information on inclusion and exclusion criteria.

Data were collected from December 2021 until June 2022. The study was approved by the University of Sydney Human Research Ethics Committee (reference 2021/804).

Survey design

The DCE attributes and attribute levels were developed from reviewing the literature [6, 36–41] and clinician input within the research team. Qualitative semi-structured interviews were conducted online with person representatives and patients from dementia organisations ($n = 2$) and clinicians ($n = 3$) to also inform the attributes and assess the DCE questionnaire—see Appendix B, Supplementary Material, for additional information. The six attributes used to describe the deprescribing and status quo (medicines continued) alternatives and their levels are summarised in Table 1. Five of the attributes presented event risks: risk of stroke, myocardial infarction, increased blood pressure, cognitive decline, having a fall; a sixth attribute described pill burden.

The deprescribing and status quo options were presented as labelled alternatives in each choice question. The status quo alternative was described as continuing the antihypertensive medicines for the person living with dementia and included fixed levels of the six attributes.

Ngene version 1.2.1 [42, 43] was used to generate a D-efficient design with 48 choice tasks in four blocks of 12 choice tasks with two alternatives per choice task (D-error = 0.000873). The DCE used a forced choice design with a status quo alternative. The electronic DCE questionnaire utilised the Qualtrics survey platform (version September 2021) [44] and participants were randomly assigned one of the four blocks of choice questions from the design. A sample size calculation was not included as traditional power and sample size calculations are not relevant for DCEs [32]. See Appendix C, Supplementary Material, for more information on survey design and sample size. An example choice question from the DCE is shown in Supplementary Figure 1 of Supplementary Material.

Analysis

R version 4.2.0 was used to generate descriptive statistics and NLOGIT version 6 was used for the DCE analyses [45, 46]. All attributes were coded as continuous variables. Dummy variables were created to capture respondent groups (carers of people with dementia, people living with dementia, and geriatricians and non-geriatrician clinicians who treat people with dementia).

The likelihood of choosing to deprescribe antihypertensive medicines for people living with dementia compared with the status quo of continuing these medicines was estimated using a mixed multinomial logit (MMNL) model to account for the correlated nature of the repeated choices within an individual. Each attribute was interacted with the respondent type dummy variable in the same MMNL

model to allow estimation of respondent-specific attribute coefficients. The final MMNL model specified normally distributed random parameters and used 20,000 Halton draws. The potential harms and benefits (except pill burden) are modelled as the risk for an additional person out of 100 having or avoiding the event, respectively. Pill burden is modelled for one less tablet per day. The final model was selected based on the normalised Akaike information criterion value (AIC/N). The final MMNL model results are presented as the estimated beta parameters, odds ratios (ORs), the OR 95% confidence intervals (95% CI), *P*-values (with the statistical significance threshold of $P < 0.05$) and the standard deviations (SD) of the random parameters. The utility functions for final MMNL model are summarised in the Supplementary Material.

Results

There were 112 respondents in total, comprising of 19 people living with dementia (contributing 200 observations, i.e. 200 completed choice questions), 33 carers (362 observations) and 60 clinicians (693 observations) resulting in a total of 1,255 observations for analyses. Table 2 reports selected demographic characteristics of the study sample and the complete demographic characteristics are presented in Supplementary Table S1. Three clinician respondents were excluded as they were Australian-based pharmacists who do not have prescribing authority; therefore, they did not meet the clinician inclusion criteria of treating and prescribing for people with dementia. People living with dementia respondents had longer survey completion time compared with carers and clinicians. Clinicians with geriatric specialty training comprised 78% of the clinician respondents; it was therefore possible to conduct analyses by clinician subgroup (geriatricians ($n = 47$) and non-geriatricians ($n = 13$)). People living with dementia self-reported mild (42%) and moderate (58%) severity of dementia symptoms. Whilst all respondents were English-speaking, 12–28% reported being multilingual with another language other than English spoken at home.

In the MMNL modelling analyses, the interaction terms for the geriatricians and non-geriatricians with the blood pressure and pill burden attributes were collapsed to a single-clinician sub-group because of lack of significance in the model and for model parsimony. Inclusion of sociodemographic variables in the MMNL model were explored, but not included in the final model as they did not influence the choice of prescribing alternative, likely because of the small sample size. Results of the final MMNL model are discussed below and presented in Table 3 and the SD and associated *P*-values for this model are presented in Supplementary Table S2.

The non-significant estimate for the deprescribing alternative specific constant (estimated beta coefficient = −0.13; Table 3) indicates that all else being equal, there is no underlying preference for either deprescribing or the status quo alternative—the preferences in this sample of respondents appear to be driven by the attributes and their levels.

For each additional person (out of 100) having a stroke in the deprescribing alternative compared with the status quo, carers (OR = 0.71, 95% CI 0.58–0.88), geriatricians (OR = 0.71, 95% CI 0.55–0.92) and non-geriatricians (OR = 0.62, 95% CI 0.45–0.86) were significantly less likely to prefer deprescribing antihypertensive medicines for people living with dementia.

For each additional person (out of 100) having a myocardial infarction in the deprescribing alternative compared with the status quo, carers (OR = 0.84, 95% CI 0.73–0.98) and non-geriatricians (OR = 0.81, 95% CI 0.69–0.95) were significantly less likely to prefer deprescribing antihypertensive medicines for people living with dementia.

A higher risk of a significant increase in blood pressure (per additional person out of 100) did not significantly influence respondent preferences for deprescribing. This lack of impact was consistent across all three respondent types, i.e. carers, people living with dementia, and clinicians.

For each additional person (out of 100) avoiding a fall in the deprescribing alternative compared with the status quo, geriatricians (OR = 1.20, 95% CI 1.11–1.29) and non-geriatricians (OR = 1.16, 95% CI 1.07–1.25) were significantly more likely to prefer deprescribing antihypertensive medicines for people living with dementia. The preferences for deprescribing antihypertensives were very similar for both the geriatricians and non-geriatricians.

For each additional person (out of 100) avoiding a noticeable decline in cognitive function in the deprescribing alternative compared with the status quo, carers (OR = 1.27, 95% CI 1.09–1.48) and geriatricians (OR = 1.17, 95% CI 1.03–1.33) were significantly more likely to prefer deprescribing antihypertensive medicines for people living with dementia.

For decreasing pill burden (i.e. for one less tablet per day) in the deprescribing alternative compared with the status quo, only people living with dementia (OR = 1.95, 95% CI 1.08–3.52) were significantly more likely to prefer deprescribing antihypertensive medicines.

Discussion

To our knowledge, this study is amongst the first to explore antihypertensive deprescribing preferences of people with dementia, carers and clinicians. The main findings of this study suggested that decreasing pill burden was the only attribute associated with a higher likelihood of people living with dementia choosing to deprescribe antihypertensives. The most important attribute associated with a lower likelihood of carers preferring deprescribing of antihypertensives was the increased risk of stroke followed in importance by increased risk of myocardial infarction. The attribute associated with a higher likelihood of carers choosing to deprescribe antihypertensives was the decreasing risk of noticeable decline in cognitive function in the person with dementia. The most important attribute associated with a lower likelihood of both geriatricians and non-geriatricians choosing to deprescribe antihypertensives was increasing risk of stroke, followed by increasing risk in myocardial infarction that applied to non-geriatricians only.

Table 2. Selected demographic characteristics of DCE respondents

Variable	Variable sub-level/s	People living with dementia (PLWD)	Carers	Clinicians
Completion rate	Excluded	0 (0%)	0 (0%)	3 (2%)
	Completed at least one DCE choice question	19/37 (51%)	33/53 (62%)	60/127 (47%)
Number of respondents used in analyses	*N*	19	33	60
Age of respondent (years)	Mean age (SD)	71 (9.1)	60.1 (14.6)	45 (8.8)
	Range	56–89	25–87	30–69
Location of respondent	New South Wales	11 (58%)	18 (55%)	12 (20%)
	Victoria	7 (37%)	7 (21%)	6 (10%)
	Queensland	0 (0%)	1 (3%)	16 (27%)
	Australian Capital Territory	0 (0%)	4 (12%)	4 (7%)
	Tasmania	0 (0%)	0 (0%)	1 (2%)
	South Australia	1 (5%)	2 (6%)	3 (5%)
	Northern Territory	0 (0%)	0 (0%)	0 (0%)
	Western Australia	0 (0%)	1 (3%)	0 (0%)
	Outside Australia	–	–	19 (32%)
Gender of respondent	Male	7 (37%)	6 (18%)	24 (40%)
	Female	12 (63%)	27 (82%)	36 (60%)
Main language spoken at home for respondent	English	15 (79%)	29 (88%)	43 (72%)
Employment situation of respondent	Employed full time	1 (5%)	6 (18%)	43 (72%)
	Employed part-time	1 (5%)	5 (15%)	14 (23%)
	Not employed at the moment	0 (0%)	0 (0%)	0 (0%)
	Family caring/home duties	0 (0%)	2 (6%)	0 (0%)
	Retired	13 (68%)	14 (42%)	0 (0%)
	Studying full time	0 (0%)	0 (0%)	0 (0%)
	Other	0 (0%)	2 (6%)	0 (0%)
	Did not answer	4 (21%)	4 (12%)	3 (5%)
Highest level of education of respondent	Post-high school qualification	8 (42%)	28 (85%)	–
	High school or less	6 (32%)	1 (3%)	–
	Did not answer	5 (26%)	4 (12%)	–
Survey duration (minutes)[b]	Mean (SD)	149 (557)	20 (10.2)	24 (44.5)
	Median (IQR)	19 (11–24)	17 (12.9–23)	14 (9.3–19.7)
	Range	6–2,379	4–51	4–331
Dementia severity for PLWD[a]	Mild	8 (42%)	6 (18%)	11 (18%)
	Moderate	11 (58%)	15 (45%)	32 (53%)
	Advanced	0 (0%)	11 (33%)	16 (27%)
Living situation for PLWD[a]	Living independently at home	15 (79%)	7 (21%)	9 (15%)
	Receive some home care help	4 (21%)	14 (42%)	33 (55%)
	Living in residential aged care facility	0 (0%)	11 (33%)	15 (25%)
	Other	0 (0%)	1 (3%)	3 (5%)
Has a surrogate decision maker for PLWD[a]	Yes	7 (37%)	26 (79%)	47 (78%)
	No	8 (42%)	6 (18%)	10 (17%)
	Do not know	3 (16%)	1 (3%)	3 (5%)
	Did not answer	1 (5%)	0 (0%)	0 (0%)
Has an advanced care plan for PLWD[a]	Yes	9 (47%)	23 (70%)	23 (38%)
	No	8 (42%)	10 (30%)	27 (45%)
	Do not know	0 (0%)	0 (0%)	10 (17%)
	Did not answer	2 (11%)	0 (0%)	0 (0%)
Clinical specialty/training area	General practice	–	–	3 (5%)
	General physician	–	–	1 (2%)
	Geriatrics	–	–	47 (78%)
	Neurology	–	–	0 (0%)
	Clinical pharmacology	–	–	2 (3%)
	Cardiology	–	–	0 (0%)
	Nurse Practitioner	–	–	0 (0%)
	Other	–	–	7 (12%)

IQR = Interquartile range [a]Carer and clinician answers reflected the PLWD that they were caring for or considering when completing the choice questions, respectively, and PLWD answered in terms of themselves. [b]Excludes outlier PLWD respondent who had a duration of 119,880 min and outlier clinician respondent who had a duration of 6,657,701 min. All respondents could keep the survey open and return to it periodically; however, these were extreme periods of time for these two respondents.

Table 3. Results of final MMNL model

Attributes	Beta	OR for choosing deprescribing	OR 95% CI	*P*-value
Deprescribing constant	−0.13	–	–	0.853
1. **Risk of stroke:** for each additional person (out of 100) having a stroke in the deprescribing alternative compared with the status quo				
Stroke_Carer	**−0.34**	**0.71**	**(0.58–0.88)**	0.002
Stroke_Person living with dementia (PLWD)	−0.23	0.80	(0.58–1.09)	0.156
Stroke_Geriatrician	**−0.34**	**0.71**	**(0.55–0.92)**	0.010
Stroke_Non-Geriatrician	**−0.47**	**0.62**	**(0.45–0.86)**	0.004
2. **Risk of myocardial infarction:** for each additional person (out of 100) having a myocardial infarction in the deprescribing alternative compared with the status quo				
Myocardial Infarction_Carer	**−0.17**	**0.84**	**(0.73–0.98)**	0.028
Myocardial Infarction_PLWD	−0.06	0.94	(0.81–1.10)	0.457
Myocardial Infarction_Geriatrician	−0.05	0.95	(0.80–1.14)	0.578
Myocardial Infarction_Non-Geriatrician	**−0.21**	**0.81**	**(0.69–0.95)**	0.011
3. **Risk of significant increase in blood pressure (BP):** for each additional person (out 100) having a significant increase in BP in the deprescribing alternative compared with the status quo				
Blood Pressure_Carer	0.012	1.013	(0.93–1.10)	0.776
Blood Pressure_PLWD	0.001	1.001	(0.91–1.11)	0.992
Blood Pressure_Clinician	0.004	1.004	(0.95–1.07)	0.898
4. **Risk of falls:** for each additional person (out of 100) avoiding a fall in the deprescribing alternative compared with the status quo				
Falls_Carer	0.04	1.04	(0.98–1.11)	0.180
Falls_PLWD	−0.02	0.98	(0.91–1.05)	0.516
Falls_Geriatrician	**0.18**	**1.20**	**(1.11–1.29)**	<0.001
Falls_Non-Geriatrician	**0.15**	**1.16**	**(1.07–1.25)**	<0.001
5. **Risk of noticeable decline in cognitive function:** for each additional person (out of 100) avoiding noticeable decline in cognitive function in the deprescribing alternative compared with the status quo				
Cognitive Decline_Carer	**0.24**	**1.27**	**(1.09–1.48)**	0.002
Cognitive Decline_PLWD	0.02	1.02	(0.92–1.12)	0.747
Cognitive Decline_Geriatrician	**0.16**	**1.17**	**(1.03–1.33)**	0.014
Cognitive Decline_Non-Geriatrician	0.01	1.01	(0.89–1.15)	0.890
6. **Pill burden:** for one less tablet per day in the deprescribing alternative compared with the status quo				
Pill Burden_Carer	−0.26	0.77	(0.46–1.29)	0.321
Pill Burden_PLWD	**0.67**	**1.95**	**(1.08–3.52)**	0.026
Pill Burden_Clinician	−0.16	0.85	(0.55–1.33)	0.478

Model parameters and fit:

- Log likelihood = −524.73
- Likelihood ratio test = −869.90, $P < 0.00001$
- McFadden pseudo R^2 = 0.3967875
- AIC = 1141.5
- N = 1,255
- AIC/N = 0.910
- K = 46

Note: **Bold** indicates statistical significance at $P < 0.05$ or $P < 0.01$. Beta = estimated coefficient from model. N = number of observations. K = number of parameters in the model. For each unit change in risk of benefit or harm, the respondent is either more likely (OR > 1), or less likely (OR < 1) to choose the deprescribing option relative to continuing the antihypertensive medicines; OR = 1 = respondent is equally likely to choose the deprescribing option or continuing the antihypertensive medicines, and there is no association between a unit change in risk of benefit or harm and choosing either alternative.

The most important attribute associated with a higher likelihood of both geriatricians and non-geriatricians choosing to deprescribe antihypertensives was decreasing risk of falls, followed by decreasing risk of noticeable decline in cognitive function in the people living with dementia that applied to geriatricians only.

Decreasing pill burden may be important to people living with dementia because the progressive decline in cognitive function could impair a person's ability to understand and follow medicine regimens. Barriers to medicine adherence include declining cognitive function and increased pill burden [47]. Deprescribing to reduce polypharmacy in people with dementia also aligns with the World Health Organization Global Patient Safety challenge to reduce polypharmacy in vulnerable populations [48]. People with dementia may also prioritise decreasing pill burden as their treatment goals may focus on tasks that relate to current activities to manage daily life rather than reducing risk of a future medical event, especially as their dementia symptoms progress.

Carers and people living with dementia appeared to have different preferences to clinicians. These potential differences suggest that shared decision-making discussions are warranted when treating people with dementia as the treatment goals of people living with dementia and carers may differ from their clinicians. Other research has also identified

differences in stakeholder preferences within other contexts, e.g. when prescribing for diabetes and hypertension, clinicians were more likely to rank hypertension as important, whereas patients were more likely to rank pain, depression and breathing problems as important [49]. Stakeholder preferences from studies such as this DCE, in conjunction with other guidance and tools [9, 10, 50], could help inform and improve implementation of deprescribing in clinical practice, including deprescribing antihypertensive medicines for people with dementia. This study is also useful for informing specific contexts for shared decision-making because of its focus on hypertension management and inclusion of people with dementia, as previous research on patient and clinician preferences relate to people with multimorbidity and rarely include people living with dementia [51, 52].

Although the clinicians overall had similar preferences for some of the attributes, i.e. less likely to deprescribe antihypertensives with increasing risk of stroke and more likely to deprescribe with increasing avoidance of falls; for some attributes, there also appeared to be differences in the preferences of geriatrician and non-geriatrician clinicians. However, whilst the point estimates differed for these attributes, the confidence intervals overlapped, and this finding should be considered as hypothesis generating. Other research has shown that clinician treatment priorities and deprescribing decisions are influenced by previous experience as well as knowledge in their areas of clinical training [53–55]. Hence different preferences for geriatricians compared with non-geriatricians are not unexpected. The preference for geriatricians to choose deprescribing antihypertensives with increasing avoidance of decline in cognitive function, compared with non-geriatricians, is not unexpected as dealing with declining cognitive function in people with dementia is an area that geriatricians are highly experienced with.

Strengths and limitations

Our study demonstrates that people living with dementia and their carers can complete DCE surveys. Previous DCE research relating to cardiovascular health has focussed only on clinician preferences, and on cognitively intact older people [56, 57]. Whilst the sample size was smaller than several previous DCEs, we still recruited 52 people with dementia and carers. Many attributes in this DCE study were significant in predicting choice, even with a small sample. The inclusion of people living with dementia, carers and clinicians enabled the study to compare potential differences in preferences across these stakeholders. However, capturing the preferences of the stakeholders in a single DCE added length and complexity to the DCE questionnaire, which could have contributed to the challenges with recruitment and sample size. The DCE methodology could be used to explore trade-offs for other factors that are associated with deprescribing in people living with dementia.

The relatively small sample is a limitation for this study, and as with all surveys, there is the potential for selection bias. A systematic review identified a sample size range of 17–1,301 for DCEs and highlighted that smaller sample sizes are a common challenge in DCEs studying preferences of people with dementia [58]. The study results may not be generalisable outside the study samples because of the use of convenience sampling and the inability to determine a response rate or respondent representativeness. Whilst this study did utilise qualitative work with stakeholders to develop the attributes and levels and test the DCE questionnaire, we acknowledge the potential to have augmented this pre-DCE qualitative input. Hypothetical bias is also a consideration because of the use of hypothetical scenarios in DCEs if they do not reflect the true nature of the choice faced by participants [59]. However, this DCE aimed to minimise hypothetical bias by developing choice tasks that reflected potential benefits and harms that are relevant to both clinicians and consumers when choosing to deprescribe antihypertensives in people living with dementia.

The estimates for the attribute levels were informed by the available literature on the population level risks of the events, with and without deprescribing; and uncertainty was captured by presenting the varying level values for each attribute across the choice questions. Although the DCE method is robust, its results indicate preferences for attributes and attribute levels as developed and defined in this DCE, thus preferences may differ if attributes levels are defined differently. No internal consistency checks (i.e. repeat or 'dominant' choice questions) were included to avoid increasing cognitive load for respondents with additional DCE questions. There is also current debate in the literature about the usefulness of these tasks, with authors recently finding that they are unreliable screening tests for 'irrationality' and costly in terms of statistical power [60]. DCEs can be challenging to complete; however, some other DCE studies have indicated that people with cognitive impairment can undertake DCEs [61–65]. In addition, the finding that decreasing pill burden positively influenced the preferences for deprescribing for people with dementia was in the a priori expected direction, and supports the suggestion that respondents understood the attributes and direction in this DCE.

Future research could expand work from this study, including recruiting larger sample sizes to explore the non-significant attributes in this study and further subgroup analysis by clinical specialty. There is also opportunity to explore the influence of sociodemographic factors on stakeholder preferences for deprescribing antihypertensives in people living with dementia. There is also the potential to use DCE methodology with dyads and/or triads of these stakeholders and other research is investigating this approach [66].

Conclusion

This DCE provides evidence that the preferences of people living with dementia, carers and clinicians may differ when considering the decision to deprescribe antihypertensives

and highlights the potential different treatment priorities for these groups. These potential differences in treatment priorities highlight the importance of capturing and incorporating the values of all these stakeholders to help inform and align shared decision-making discussions in clinical practice. The study adds to the available evidence around the importance of preferences in implementing deprescribing antihypertensives in people living with dementia. Furthermore, it highlights the need for shared decision-making within the deprescribing process.

Supplementary Data: Supplementary data mentioned in the text are available to subscribers in *Age and Ageing* online.

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