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Authors	O'Riordan, David;Byrne, Stephen;Fleming, Aoife;Kearney, Patricia M.;Galvin, Rose;Sinnott, Carol
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THERAPEUTICS

GPs' perspectives on prescribing for older people in primary care: a qualitative study

Correspondence David O Riordan, MPharm, MPH, Pharmaceutical Care Research Group, Cavanagh Pharmacy Building, University College Cork, College Road, Cork, Republic of Ireland. Tel.: +353 2 1490 1690; Fax: +353 2 1490 1656; E-mail: davidoriordan@ucc.ie

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David O. Riordan[1], Stephen Byrne[1], Aoife Fleming[1], Patricia M. Kearney[2], Rose Galvin[3] and Carol Sinnott[4]

[1]Pharmaceutical Care Research Group, School of Pharmacy, University College Cork, Cork, Republic of Ireland, [2]Department of Epidemiology & Public Health, University College Cork, Cork, Republic of Ireland, [3]Department of Clinical Therapies, Health Research Institute, University of Limerick, Limerick, Republic of Ireland, and [4]Department of General Practice, University College Cork, Cork, Republic of Ireland

Keywords GP prescribing, older people, primary care, semi-structured interviews, Theoretical Domains Framework

AIMS

The aim of this study was firstly to reveal the determinants of GP prescribing behaviour for older adults in primary care and secondly to elicit GPs' views on the potential role for broad intervention strategies involving pharmacists and/or information technology systems in general practice.

METHODS

Semi-structured qualitative interviews were carried out with a purposive sample of GPs. Three multidisciplinary researchers independently coded the interview data using a framework approach. Emerging themes were mapped to the Theoretical Domains Framework (TDF), a tool used to apply behaviour change theories.

RESULTS

Sixteen GPs participated in the study. The following domains in the TDF were identified as being important determinants of GP prescribing behaviour: 'Knowledge', 'Skills', 'Reinforcement', 'Memory Attention and Decision Process', 'Environmental Context and Resources', 'Social Influences', 'Social/Professional Role and Identity'. Participants reported that the challenges associated with prescribing for an increasingly older population will require them to become more knowledgeable in pharmacology and drug interactions and they called for extra training in these topics. GPs viewed strategies such as academic detailing sessions delivered by pharmacists or information technology systems as having a positive role to play in optimizing prescribing.

CONCLUSION

This study highlights the complexities of behavioural determinants of prescribing for older people in primary care and the need for additional supports to optimize prescribing for this growing cohort of patients. Interventions that incorporate, but are not limited to interprofessional collaboration with pharmacists and information technology systems, were identified by GPs as being potentially useful for improving prescribing behaviour, and therefore require further exploration.

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WHAT IS ALREADY KNOWN ABOUT THIS SUBJECT

- Providing optimal medication management for older people is a challenge for GPs.
- Prescribing for older people can result in medication-related problems and preventable drug-related morbidity.
- As the main prescribers of medication in primary care, GPs can provide a deeper insight into the complexities of prescribing for these patients.

WHAT THIS STUDY ADDS

- Prescribing for the growing older population is viewed by GPs as a significant challenge in their clinical practice.
- GPs are calling for additional support in order to help them manage and treat these patients.
- Academic detailing, an approach that provides GPs with accurate, non-biased and evidence-based information, is viewed by GPs as a potentially useful way to help optimize their prescribing. Information technology systems are also identified by GPs as having a role to play in supporting safer prescribing.

Introduction

Providing optimal care for older adults creates many challenges for healthcare providers, especially general practitioners (GPs) [1–4]. Appropriate prescribing of medications is a significant challenge as older adults can present with multiple conditions for which multiple medications are often indicated [5, 6]. Age-related changes in pharmacokinetics and pharmacodynamics contribute to the challenge of appropriate prescribing [7]. Inappropriate prescribing results in preventable drug-related morbidity (PDRM), including adverse drug events (ADEs), hospital admissions and mortality [8–10]. Potential PDRM events occur in 1% of patients attending general practice, with the most common PDRM events relating to the use of non-steroidal anti-inflammatory (NSAID) medicines in patients with congestive heart failure or hypertension, lack of monitoring in patients prescribed angiotensin converting enzyme (ACE) inhibitors, and the use of hypnotic-anxiolytic agents [11].

As GPs are the main prescribers of medication in primary care, understanding the factors influencing GP behaviour in relation to prescribing is a first step in reducing PDRM and improving clinical outcomes [12]. Previous research has shown that factors influencing GP prescribing decisions include medication effectiveness, associated risks, medication costs and patient characteristics or preferences [13]. Other influences include factors which relate specifically to the individual GP such as postgraduate qualifications or training [14], the prescribing behaviour of hospital consultants [15], or advertising by the pharmaceutical industry [16]. However, how best to intervene on these influences to improve GP prescribing is not known. It has been proposed that knowledge of the key determinants of health care professionals' (HCP) behaviour can be used to theoretically inform interventions that aim to change that behaviour [17]. Additionally, qualitative research with HCPs can inform and optimize the delivery of subsequent interventions.

The Theoretical Domains Framework (TDF) is an overarching framework of theories that identifies the specific process underlying successful behaviour change [18]. It consists of 14 domains and 84 component constructs [19]. The TDF has been used to identify key theoretical domains that are perceived to influence HCPs' behaviours [19]. For example, Cullinan *et al.* used the TDF to identify key influences of potentially inappropriate prescribing (PIP) by hospital doctors such as insufficient training in prescribing for older people [20].

The aim of this study was firstly to reveal the determinants of GP prescribing behaviour for older adults in primary care and secondly to elicit GPs' views on the potential role for broad intervention strategies, e.g. involving pharmacists and/or information technology systems in general practice. Participants were also encouraged to suggest any other types of intervention that they thought would be feasible and useful.

Methods

Design

Semi-structured qualitative interviews were conducted with GPs in primary care to explore their experiences of prescribing for patients aged over 65 years and their views on the potential role for interventions involving pharmacists and/or information technology systems in general practice. This interview method was chosen due to its flexible and interactive nature and its ability to achieve comprehensive coverage of the topic discussed [21]. The descriptions of their experiences were analysed using qualitative methods and mapped to the TDF framework to reveal behavioural determinants.

Sampling

This study was conducted in County Cork, Republic of Ireland. A purposive sample of GPs in teaching practices associated with University College Cork (UCC) were initially invited to participate. The purposive sampling strategy was based on years of experience (>10 or <10 years), practice location (% urban population of GP practice location) and practice size (single or group practice). There were no inclusion or exclusion criteria for participants other than a requirement to be in active clinical practice. D.O.R. contacted potential participants by telephone and a brief summary of the study was given. In some cases, snowball sampling was used when participants who were based in single rural practices and had already been interviewed were asked to identify other GPs whom they thought might be interested in participating. The nominated GPs were then sampled according to the needs of the sampling frame.

Two pilot interviews were conducted. Following review of the data and topic guides, the authors agreed to include the data generated from the pilot interviews as it was highly relevant to the study question.

The method developed by Francis *et al*. was used to determine data saturation [22]. Firstly, the authors agreed *a priori* that the first 10 participants (initial analysis sample) represented adequate diversity on the pre-specified stratification factors (years of experience, gender, practice location and practice size). Secondly, it was agreed *a priori* that after 10 interviews were conducted, data saturation was reached once three consecutive interviews did not contribute further to thematic development (stopping criterion). The stopping criterion was tested after each successive interview, e.g. 11, 12, 13. At interview 13, a further three interviews were carried out to identify new themes. However, these additional interviews did not contribute to the further development of emerging themes. Therefore, interview 16 was defined as the point of data saturation.

Data collection

The interviews were carried out by one researcher (D.O.R.) at the GP surgeries between March 2015 and August 2015.

A topic guide was developed based on previous literature and was agreed on by all authors [23, 24]. It was iteratively refined after each interview was transcribed and analysed to pursue emerging themes. Further refinements were reviewed by another author (C.S.) and examples are provided as supplementary material (see Appendix S1) to show its continuous development as the interviews proceeded. Demographic details were collected including practice location, GP gender, years' experience as a GP and number of GPs, including GP registrars where relevant, working in the practice. In addition to questions on their experience of prescribing for older patients, participants were asked for their views on the potential role for interventions (i.e. involving pharmacists and/or information technology systems) in general practice.

The interviews were audio-recorded, fully transcribed and saved in NVivo Qualitative Data Analysis Software (V.10.22) to facilitate analysis (QSR International, Doncaster, Vic., Australia. Field notes were written and used to facilitate preliminary familiarization with emerging themes immediately after each interview.

Analysis

The framework approach, which consists of five stages, was used to analyse the data [21]. The first phase involved reading and re-reading each transcript as well as listening to interview recordings to become familiar with the content. The second phase involved identifying a thematic framework. Due to the specifics of the research aim, a deductive approach was taken with agreement *a priori* by the authors to use the Theoretical Domains Framework (TDF). The next phase was indexing: this involved open coding (carried out by D.O.R.) and development of a coding scheme. The fourth phase involved arranging data into domains of the TDF and generating charts. The last phase involved interpreting the data by finding associations between themes with the aim of providing explanations for them. To enhance the credibility of coding, three multidisciplinary researchers (D.O.R., C.S. and S.B.) independently coded a sample of the transcripts.

The consolidated criteria for reporting qualitative research (COREQ) statement was used to guide reporting of the findings (see Appendix S2) [25].

Ethical approval for this study was granted by the clinical research ethics committee of the Cork University Teaching Hospitals (reference ECM 3 (mmm) 14/04/15 & 4 (k) 07/10/14). All participants provided written informed consent.

Results

Sixteen interviews were conducted in total. The interviews ranged from 9 min to 31 min (mean interview length 19 min). The mean duration of participating GPs' medical experience was 17 years. The number of GPs working in a practice ranged from 1 to 6. The characteristics of participants interviewed are provided in Table 1.

The definition of all 14 TDF domains as described by Cane *et al*. together with supporting quotes from participants are shown in Table 2 [19].

Almost all of the TDF domains were seen to be relevant to the study data but the domains presented in detail here were prioritized because of the emphasis placed on them by participants, the frequency of occurrence of the domain across all the transcripts, and the consensus agreement of the authors.

Important influences on GP prescribing behaviour identified using the TDF

Knowledge/Skills. Although they are described separately in the TDF, it was decided to merge the domains 'Knowledge' and 'Skills' as the findings that emerged were overlapping and therefore are reported as a single domain.

Participants reported the responsibility of prescribing for increasing numbers of complicated older patients as a burden. They voiced that they felt this would become even more demanding in the future. Participants reported a need to become more knowledgeable in pharmacology and drug interactions and they called for extra training in order to manage and treat these patients.

> *'… it's going to have a huge impact on general practice and GPs, I think we'll need to try and continue to improve our skills in that area and I think … care of the elderly … will be a speciality … it's going to present a lot of challenges in terms of knowing the pharmacology and interactions.'* (GP11)

Participants acknowledged the importance of their role as prescribers and suggested regular evaluation of their prescribing knowledge would motivate GPs to stay up-to-date with their prescribing skills and in some cases change the way they practise or enhance the care of their patients.

> *'I personally think that we should have to every 6 or 12 months sit some kind of exam in prescribing … because prescribing is so desperately important and I think the only way I would actually change the way I practise is if there was some kind of revalidation.'* (GP15)

Table 1

Characteristics of GP participants

General Practitioner (GP)	Gender	Years of medical experience	% urban population of GP practice location	No. of GPs in the practice	No. of GP registrars in the practice
1	F	4	19.5	2	0
2	F	20	25.7	4	1
3	M	33	25.7	4	1
4	F	20	25.7	1	0
5	F	4	100	2	0
6	M	25	25.7	4	1
7	F	4	8.4	2	0
8	M	20	100	2	0
9	M	35	25.7	4	1
10	F	19	25.7	1	0
11	F	13	100	3	1
12	F	4	25.7	4	1
13	M	3	19.5	2	0
14	M	30	100	3	1
15	M	14	8.8	6	0
16	M	27	25.7	4	1

Participants reported that they are influenced by information provided by pharmaceutical drug representatives despite viewing this information as biased. They called for alternative sources of succinct information that can be delivered in their practices, but is independent of the pharmaceutical industry and is evidence-based.

> *'Three times a week for 5 minutes I meet a drug rep … so while we take it with a pinch of salt, because we know it's biased … we inevitably are influenced by drug reps.'* (GP15)

Reinforcement. Participants viewed prescribing in older people as a potential source of litigation should a prescribing error arise. They reported that the risk of error is higher in these patients due to the medical complexity and the possible interactions and side effects associated with the use of multiple medicines. The fear of litigation made some GPs more cautious and acted as an incentive to optimize their prescribing for these patients.

> *'I'm pretty sure it's out there somewhere that it's the biggest source of litigation I think for GPs is prescribing or … prescribing errors.'* (GP13)

Memory attention and decision process

Participants actively considered various factors when prescribing medicines, e.g. when to start them, when to stop them, their side-effects, their potential for addiction, their potential adverse outcomes. The decision-making process can become more complicated when a patient is already prescribed multiple medicines. This was mentioned as a particular issue when considering medicines with potential adverse effects, as they can lead to a prescribing cascade.

> *'If you do need to use something … bearing in mind their cardiovascular risk, bearing in mind their falls risk that go with lots of the sedative medication, antipsychotics, sleeping tablets … I think that's my biggest bugbear, difficulty.'* (GP13)

Some participants were reluctant to prescribe potentially useful medicines such as methotrexate out of fear of their side-effects in older, more vulnerable patients. It was also evident that there was a level of caution and uncertainty around the prescribing of these high-risk medicines.

> *'But if it was something like methotrexate … even thinking about it now would give you the heebee jeebees … you've somebody elderly in front of you and you're really not sure, I just don't think you can prescribe it really you know.'* (GP11)

Environmental context and resources

Although prescribing was seen as an important responsibility by participants, they did not always get time to review medications as thoroughly as they would like.

> *'If you're really busy sometimes and I'm just being honest, you just print off their last month's prescription and you'll keep going with that, you know.'* (GP4)

Pharmacists were described as a useful resource for GPs especially in cases where older patients were having

Table 2

TDF domains, explanatory constructs and supporting quotes [19]

Domain (definition) and constructs	Domain reported in the study results	Supporting quotes
1. Knowledge (an awareness of the existence of something) **Constructs** • **Knowledge (including knowledge of condition/scientific rationale)** • **Procedural knowledge** • **Knowledge of task environment**	✓	*'… It's going to have a huge impact on general practice and GPs, I think we'll need to try and continue to improve our skills in that area and I think care of the elderly… will be a speciality … it's going to present a lot of challenges in terms of knowing the pharmacology and interactions.'* (GP11) *'Three times a week for 5 minutes I meet a drug rep … so while we take it with a pinch of salt, because we know it's biased … we inevitably are influenced by drug reps …'* (GP15)
2. Skills (an ability or proficiency acquired through practice) **Constructs** • **Skills/Skills development** • **Competence** • **Ability** • **Interpersonal skills** • **Practice** • **Skill assessment**	✓	*'I personally think that we should have to every 6 or 12 months sit some kind of exam in prescribing … because prescribing is so desperately important and I think the only way I would actually change the way I practise is if there was some kind of revalidation.'* (GP15) *'We find that in General Practice there are so many important areas we need to up skill in. And this is a particularly important one (Educational training), and I think you'd probably find that most GPs would agree with that.'* (GP5)
3. Social/Professional Role and Identity (a coherent set of behaviours and displayed personal qualities of an individual in a social or work setting) **Constructs** • **Professional identity/ Social identity** • **Professional role** • **Identity/Group identity** • **Professional boundaries** • **Professional confidence** • **Leadership** • **Organizational commitment**	✓	*'I think some of the hospital sector, don't fully understand the nature of general practice … I saw a person with a renal problem and I was in their house … I rang the Urology (team) because they had a nephrostomy tube and they were asking me what his creatinine was… they just had no idea that you don't have a portable creatinine monitor by your side.'* (GP8) *'As a GP you have a role as a co-ordinator of care, and you'd have the most up to date record of everything that's going on.'* (GP5)
4. Beliefs about Capabilities (acceptance of the truth, reality, or validity about an ability, talent or facility that a person can put to constructive use) **Constructs** • **Self-confidence** • **Perceived competence** • **Self-efficacy** • **Perceived behavioural control** • **Beliefs** • **Self-esteem** • **Empowerment** • **Professional confidence**	X	*'I am slow to start new medications for 6 to 12 months I leave it out on the market and I think sometimes other professionals … may not think of that in a positive way but that's the way I am.'* (GP16) *'Sometimes there's this feeling going around unless you are using the new medications you are sometimes behind the times or a bit old fashioned … but sometimes it might be that there's much better evidence for the older medication or you know it's been studied a lot more and there might be very little evidence for the new one and the new one might be 5–6 times the cost if not more.'* (GP8)
5. Optimism (the confidence that things will happen for the best or that desired goals will be attained) **Constructs** • **Optimism** • **Pessimism** • **Unrealistic optimism** • **Identity**	X	*'We need enhanced roles of the … pharmacists, the practice nurses, advanced nurse practitioners, more community nurse workers as well as public health nurses you know such as dementia care nurses and things like that. I think all those things will sort of help give a better standard. I think it will happen bit by bit.'* (GP8) *'There needs to be a common goal that the patient is a priority and it is very significantly absent from management and health services. Ok, they do not look at the patient goal because the managers regard the management as being totally isolated from health responsibility. With any luck we'll bring that around.'* (GP3)

(*continues*)

Table 2

(Continued)

Domain (definition) and constructs	Domain reported in the study results	Supporting quotes
6. Beliefs about Consequences (acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation) **Constructs** • **Beliefs** • **Outcome expectancies** • **Characteristics of outcome expectancies** • **Anticipated regret** • **Consequents**	X	*'One issue that springs to mind is … benzodiazepine prescribing, so you would have a cohort of elderly patients who have been prescribed benzodiazepines for a very long period of time, that you wouldn't be in a position to be really thinking about stopping them, but certainly you would wonder if, certain events such as a fall, an episode of confusion, could be related to these particular medications.'* (GP5) *'One of the biggest problems at the moment is the generic substitution, it is confusing the hell out of all the elderly patients and that they are getting different pills, different capsules instead of pills and shapes and colours and sizes and names are all changing.'* (GP3)
7. Reinforcement (increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus) **Constructs** • **Rewards (proximal/distal, valued/not valued, probable/improbable)** • **Incentives** • **Punishment** • **Consequents** • **Reinforcement** • **Contingencies** • **Sanctions**	✓	*'I'm pretty sure it's out there somewhere that it's the biggest source of litigation I think for GPs is prescribing or … prescribing errors.'* (GP13) *'The other thing I suppose is whether this (educational training) will qualify for external CPD points. Because we're all required to get 20 external points and internal points …, and certainly if it could be something that was worth internal and external points, I think it could be beneficial.'* (GP5)
8. Intentions (a conscious decision to perform a behaviour or a resolve to act in a certain way) **Constructs** • **Stability of intentions** • **Stages of change model** • **Transtheoretical model and stages of change**	X	*'Sometimes it's nearly easier to wait until the outpatient's letter come and then start the medication.'* (GP7) *'But if it was something like methotrexate … even thinking about it now would give you the heebee jeebees … you've somebody elderly in front of you and you're really not sure, I just don't think you can prescribe it really you know.'* (GP11)
9. Goals (mental representations of outcomes or end states that an individual wants to achieve) **Constructs** • **Goals (distal/proximal)** • **Goal priority** • **Goal/target setting** • **Goals (autonomous/controlled)** • **Action planning** • **Implementation intention**	X	*'I think we are all in it for the side of the patient like what you want is a patient who's prescribed appropriate drugs, at an appropriate dose for appropriate lengths of time.'* (GP10) *'There are areas where I believe … for a pharmacist within the clinical environment. And I think that would work and certainly is one area we would love to trial and have tried to do before. It works in various areas in the UK. It's been very successful.' (GP3)*
10. Memory, Attention and Decision Processes (the ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives) **Constructs** • **Memory** • **Attention** • **Attention control** • **Decision making** • **Cognitive overload/tiredness**	✓	*'But if it was something like methotrexate … even thinking about it now would give you the heebee jeebees … you've somebody elderly in front of you and you're really not sure, I just don't think you can prescribe it really you know.'* (GP11) *' … if you do need to use something … bearing in mind their cardiovascular risk, bearing in mind their falls risk that go with lots of the sedative medication, antipsychotics, sleeping tablets … I think that's my biggest bugbear, difficulty.'* (GP13)
11. Environmental Context and Resources (any circumstance of a person's situation or environment that discourages or encourages the	✓	*'If you're really busy sometimes and I'm just being honest, you just print off their last month's*

(*continues*)

Table 2

(Continued)

Domain (definition) and constructs	Domain reported in the study results	Supporting quotes
development of skills and abilities, independence, social competence and adaptive behaviour) **Constructs** • **Environmental stressors** • **Resources/material resources** • **Organizational culture/climate** • **Salient events/critical incidents** • **Person × environment interaction** • **Barriers and facilitators**		*prescription and you'll keep going with that, you know.'* (GP4) *'We're very lucky that we have a very good relationship with the local pharmacist here they are very, very good and so we would be on to them a number of times a day … particularly for people who come out from hospital whereas sometimes it isn't clear what dose of medications they're on.'* (GP8)
12. Social influences (those interpersonal processes that can cause individuals to change their thoughts, feelings or behaviours) **Constructs** • **Social pressure/Social norms/Social comparisons** • **Group conformity/Group norms/Group identity** • **Social support** • **Power** • **Intergroup conflict** • **Alienation** • **Modelling**	✓	*'…so people do present saying I saw the ad on the telly (for an anticholinergic medication for urinary incontinence) and I have the overactive bladder and you're thinking anticholinergics and you're 75 … but they still expect it you know.'* (GP1) *'Any of those on the benzos you'd be trying to pull them all off it ... Very hard, very hard. … And in spite of you talking about the risk of falls and obviously slowly weaning off … but very hard to get patients off these tablets that are not essential really you know.'* (GP7)
13. Emotion (a complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event) **Constructs** • **Fear** • **Anxiety** • **Affect** • **Stress** • **Depression** • **Positive/negative affect** • **Burn-out**	X	*'I'm worried, I'm always worried about renal function, I'm worried about anti-inflammatories and hypertension, I'm worried about risk of bleeding, I'm worried about side-effects, probably I should worry more about drug interaction and I don't.'* (GP15) *'But as regards other people highlighting it (prescribing errors) I don't mind, I'm just embarrassed really.'* (GP11)
14. Behavioural Regulation (anything aimed at managing or changing objectively observed or measured actions) **Constructs** • **Self-monitoring** • **Breaking habit** • **Action planning**	X	*'…you had a pharmacist coming in and doing an audit on your over 65s every month, that they came in and had access to your system. I think it would be a great system.'* (GP7) *'We have started actually about 4 or 5 months ago, a repeat prescribing protocol within the practice and as part of that we look at STOPP/START.'* (GP15) [STOPP/START: Screening Tool of Older Persons Prescriptions/Screening Tool to Alert doctors to Right Treatment criteria]

compliance issues with their medicines by dispensing medicines into weekly/monthly blister packs. Reviewing prescriptions, checking drug doses and identifying potential drug interactions and side-effects were other roles where pharmacists were identified as being a valuable support to the GP. Most participants reported a good working relationship with their local pharmacist.

> *'We're very lucky that we have a very good relationship with the local pharmacist here they are very, very good and so we would be on to them a number of times a day … particularly for people who come out from hospital whereas sometimes it isn't clear what dose of medications they're on.'* (GP8)

Participants reported that GPs and pharmacists collaborate successfully together on a regular basis. However, it was suggested that the strengths of these existing relationships between GPs and pharmacists were not harnessed to their full potential. Maintaining and further enhancing the GP–pharmacist relationship was viewed as an important strategy to improve prescribing and patient care.

> *'Pharmacists and doctors work very successfully together on a daily routine basis, and that's probably not recognized enough but there is a significant interaction between the two. And anytime there's good positive interaction you'll always get positive responses and positive outputs.'* (GP3)

Participants were asked to comment about the possibility of a service-orientated outreach educational intervention (such as academic detailing) provided by pharmacists to GPs in their surgeries. Participants welcomed the idea of an educational intervention delivered to individual practices rather than larger groups of GPs.

> *'It would probably be better to have a practice do it in isolation rather than two or three practices in the area doing it together. Because I'm not sure that all practices would like to be open with other practices about their prescribing. It's kind of a personal thing isn't it?'* (GP11)

Participants were asked about using information technology systems such as clinical decision support systems to help optimize their prescribing. They acknowledged that as prescribing is a complicated process, especially in older people, computerized systems would be of some benefit but only to inform clinical situations and not to dictate them.

> *'… prescribing is so complicated in the elderly I'm not sure if a computer system could do it all. Now it might do a lot of it but at the end of the day you are still going to have to make a decision on the patient sitting in front of you.'* (GP1)

Social influences

Participants reported that older patients can be influenced by the marketing of medications in the lay media. This can in turn influence patient requests and what GPs prescribe. For example, anticholinergic medicines are indicated for urinary incontinence, but GPs reported being reluctant to prescribe them for older people due to their side-effects (i.e. falls, confusion and blurred vision). However, despite these reservations, GPs felt pressurized into prescribing these medicines due to patient expectations.

> *'… so people do present saying I saw the ad on the telly (for an anticholinergic medication for urinary incontinence) and I have the overactive bladder and you're thinking anticholinergics and you're 75 … but they still expect it you know.'* (GP1)

GPs experience difficulty in explaining why they are withholding such medications, particularly to an older person with hearing, visual or cognitive impairment.

Stopping benzodiazepine medicines was another example of how patient preference conflicted with GPs' knowledge about the risks of the medication.

> *'Any of those on the benzos you'd be trying to pull them all off it … Very hard, very hard. And … in spite of you talking about the risk of falls and obviously slowly weaning off … but very hard to get patients off these tablets that are not essential really you know.'* (GP7)

Social/professional role and identity

Overall, the collaborative relationship between primary and secondary care was described as very good. However, some participants reported a lack of appreciation by their secondary care colleagues for their role as a GP. A lack of support from secondary care was highlighted especially with the management of complex patients in general practice.

> *'I think some of the hospital sector, don't fully understand the nature of general practice … I saw a person with a renal problem and I was in their house … I rang the Urology (team) because they had a nephrostomy tube and they were asking me what his creatinine was … they just had no idea that you don't have a portable creatinine monitor by your side.'* (GP8)

GPs described themselves as co-coordinators of care for patients, which was assisted by their detailed medical record for each of their patients.

> *'As a GP you have a role as a co-ordinator of care, and you'd have the most up to date record of everything that's going on.'* (GP5)

Discussion

This study revealed the determinants influencing GP prescribing behaviour for older adults in primary care and GPs' views on potential intervention strategies to optimize prescribing for older, often multi-morbid patients. A behaviour change theory was used to analyse the data and generate findings that could be used to inform intervention strategies.

The domain 'Knowledge and Skills' highlighted that the responsibility of prescribing for increasing numbers of complicated older patients was viewed as a burden for GPs. This echoed the findings of a qualitative study of 20 practising general internists and family practitioners in the United States, which aimed to gain a deeper understanding of why they found caring for older patients so challenging. Three major domains emerged: medical complexity and chronicity – for example, older people were seen to have more medical conditions, prescribed more medicines, be more vulnerable to illnesses and more susceptible to adverse drug reactions (ADRs); personal and interpersonal challenges – e.g. hearing problems, cognitive impairment and family members caring for these patients; and administrative burden – e.g. time consuming, increased workload, risk of litigation. Contextual conditions such as the practice environment and the GPs' training and personal values also influenced the care for these patients [26].

From the domain 'Environmental Context and Resources', lack of available time for GPs was cited as a major barrier during clinical practice. As a result, GPs were unable to carry out all their clinical roles (e.g., review patient's monthly prescriptions upon renewal). Braddock *et al.* argue that the issue of time has an ethical significance as it may result in GPs sacrificing duties that promote important features of the patient–GP relationship such as trust, respect and fidelity, act as a barrier to shared decision making and being unable to fulfil their obligations as patient advocates [27].

Pharmacists were described as a reliable resource for GPs and many participants reported experiencing a good working relationship with their local pharmacist. In a qualitative study with 27 GPs and 31 pharmacists in the UK, GPs reported that knowing the pharmacist was an essential

component of a successful GP–pharmacist collaboration. This professional familiarity was also considered an important factor in the provision of local pharmaceutical services pilots. Pharmacists experienced difficulty working in collaboration with large GP surgeries. GPs who were reluctant to collaborate expressed concerns about the standard of pharmacists' qualifications and therefore questioned their professional ability. Collaboration between both HCPs was optimized with reciprocal communication. Conversely, one-way communication was associated with lower levels of collaboration [28].

Implications for research and/or practice

Computerized decision support systems are widely used tools that optimize quality of care and patient outcomes [29]. In practice, these systems may involve an alert system appearing at the end of a consultation or at the time of prescribing [30–32]. Participants in our study agreed that computerized decision support systems could be a useful resource for GP prescribing; however, some were concerned they may dictate rather than inform a clinical situation. In order for successful implementation of decision support systems in GP practices, software designers should consider the following: the system should be incorporated into the practice workflow and existing computerized systems, involve all stakeholders during various stages of the implementation process, and ensure alerts are straightforward and easy to understand [33].

This study found that GPs feel they will need additional training in pharmacology and drug interactions as the older population increases. Prescribing for older people is a complex process and GPs welcomed supportive strategies to optimize the continuing care for this group of patients. One possible solution to optimize prescribing for this growing cohort of older patients prescribed multiple medications is academic detailing (AD). Academic detailers, who are usually pharmacists, nurses or doctors, are trained to provide accurate, objective and up-to-date synthesis of the best available information on a clinical topic in an engaging format with GPs [34]. This information often includes recommendations about alternative treatment regimens or non-pharmacological interventions [35]. A pharmacist-led intervention comprising AD demonstrated an improvement in statin prescribing in high-risk patients in primary care in the UK [36]. A study in the United States found that two brief AD visits by clinical pharmacists to GPs reduced inappropriate prescribing by 14% in comparison with controls [37].

While clinical decision support systems and AD have been adopted in other countries, these strategies are not routinely available in Irish general practice.

A large body of research has been carried out on the role of pharmacists in optimizing GP prescribing in primary care. However, much of this work shows limited or inconsistent results. A Cochrane review examined the evidence for pharmacist-led interventions aimed at improving appropriate polypharmacy for older people across different healthcare settings. The authors concluded, based on the 12 studies included in the review, that it was unclear whether the interventions led to clinically significant improvements [38]. Another systematic review focused on the effect of pharmacist-led interventions in optimizing prescribing in older adults in primary care. Although it appeared that these interventions improved prescribing appropriateness, it was unclear if they resulted in clinically significant improvements in patient outcomes [39].

Despite these limited effects, our qualitative study shows that GPs still view the role of pharmacists and their own relationship with pharmacists in a positive way. It highlights that there is scope to harness the GP–pharmacist relationship to improve patient outcomes, and supports a need for intervention developers to consider other approaches to enhance the GP–pharmacist relationship in a way that will lead to meaningful and sustained improvements in prescribing.

Strengths and limitations

The findings of this study are underpinned by a theoretical model that was specifically designed for analysing HCPs' behaviour, and thus offers a number of strengths [19, 40]. The TDF facilitates comprehensive assessment of the possible influences on behaviour and lends clarity to these influences by characterizing each domain with component constructs [19]. However, the TDF is a relatively new framework and is still undergoing refinement. We suggest that future iterations of this framework may recognize the similarity between some domains in certain contexts such as 'Knowledge' and 'Skills' for cognitive tasks such as prescribing.

Prolonged engagement with the data was carried out as interviews were arranged with GPs over a five-month period, and were analysed on an iterative basis. The method developed by Francis *et al*. was used systematically to determine data saturation [22]. Data triangulation was not conducted in this study as there was only one group of research participants. As GPs are the main prescribers of medication in primary care, they were identified as the key participants to answer the study question. Also one means of data collection was used, namely semi-structured interviews. This interview method was chosen as it has the ability to achieve comprehensive coverage of the topic discussed. The validation technique of member checking was not used [41], as returning interview transcripts to participants can lead to changes being made to the transcripts which can influence the trustworthiness of any subsequent analysis.

The transferability of the data may be limited by sampling GPs from one geographical region in Ireland. However, the broad inclusion criteria (requirement to be in active practice) and the recruitment of GPs with a range of years of experience, gender, practice size and urban/rural locations helps ensure that our findings reflect the most important factors that influence GP prescribing for older people in Ireland.

Although data collection was only carried out by one researcher (D.O.R.), dependability was enhanced by using multidisciplinary team input – pharmacists (D.O.R., S.B., A.F.), GP (C.S.), physiotherapist (R.G.) and epidemiologist (P.K.) – during data analysis (investigator triangulation). Additionally, D.O.R. maintained a reflexive diary about his role and beliefs on the study topic during the course of the interviews and discussed this with other members of the team to help highlight any personal biases or challenges encountered.

Conclusion

This study has identified the key determinants that influence GP prescribing behaviour for older people in primary care. GPs are aware that prescribing for older people is a complex process that requires an increasing amount of their time and attention. GPs state that they require accurate, easily accessible sources of evidence-based data about the effectiveness and safety of treatments to support their prescribing for older, complex patients. Future interventions should incorporate means of providing such information, for example academic detailing (AD), to ensure that GPs are provided with necessary evidence and are equipped with the necessary skills to prescribe safely for the growing cohort of older, complex patients.

Competing Interests

There are no competing interests to declare.

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References

1 Boyd CM, Darer J, Boult C, Fried LP, Boult L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. JAMA 2005; 294: 716–24.

2 Boyd CM, Fortin M. Future of multimorbidity research: how should understanding of multimorbidity inform health system design. Public Health Rev 2010; 32: 451–74.

3 Mercer SW, Smith SM, Wyke S, O'Dowd T, Watt GC. Multimorbidity in primary care: developing the research agenda. Fam Pract 2009; 26: 79–80.

4 Valderas JM, Starfield B, Sibbald B, Salisbury C, Roland M. Defining comorbidity: implications for understanding health and health services. Ann Fam Med 2009; 7: 357–63.

5 Mallet L, Spinewine A, Huang A. The challenge of managing drug interactions in elderly people. Lancet 2007; 370: 185–91.

6 Gallagher P, Barry P, O'Mahony D. Inappropriate prescribing in the elderly. J Clin Pharm Ther 2007; 32: 113–21.

7 Milton JC, Hill-Smith I, Jackson SH. Prescribing for older people. Br Med J 2008; 7644: 606.

8 Hamilton H, Gallagher P, Ryan C, Byrne S, O'Mahony D. Potentially inappropriate medications defined by STOPP criteria and the risk of adverse drug events in older hospitalized patients. Arch Intern Med 2011; 171: 1013–9.

9 Jano E, Aparasu RR. Healthcare outcomes associated with Beers' criteria: a systematic review. Ann Pharmacother 2007; 41: 438–48.

10 Spinewine A, Schmader KE, Barber N, Hughes C, Lapane KL, Swine C, *et al*. Appropriate prescribing in elderly people: how well can it be measured and optimised? Lancet 2007; 370: 173–84.

11 Morris C, Rodgers S, Hammersley V, Avery A, Cantrill J. Indicators for preventable drug related morbidity: application in primary care. Qual Saf Health Care 2004; 13: 181–5.

12 Eccles MP, Armstrong D, Baker R, Cleary K, Davies H, Davies S, *et al*. An implementation research agenda. Implement Sci 2009; 4: 1–7.

13 Barber N. What constitutes good prescribing? Br Med J 1995; 310: 923–5.

14 Inman W, Pearce G. Prescriber profile and post-marketing surveillance. Lancet 342: 658–61.

15 Feely J, Chan R, McManus J, O'Shea B. The influence of hospital-based prescribers on prescribing in general practice. Pharmacoeconomics 1999; 16: 175–81.

16 Peay MY, Peay ER. The role of commercial sources in the adoption of a new drug. Soc Sci Med 1988; 26: 1183–9.

17 Eccles M, Grimshaw J, Walker A, Johnston M, Pitts N. Changing the behavior of healthcare professionals: the use of theory in promoting the uptake of research findings. J Clin Epidemiol 2005; 58: 107–12.

18 Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A. Making psychological theory useful for implementing evidence based practice: a consensus approach. Qual Saf Health Care 2005; 14: 26–33.

19 Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. Implement Sci 2012; 7: 37.

20 Cullinan S, Fleming A, O'Mahony D, Ryan C, O'Sullivan D, Gallagher P, *et al*. Doctors' perspectives on the barriers to appropriate prescribing in older hospitalized patients: a qualitative study. Br J Clin Pharmacol 2015; 79: 860–9.

21 Ritchie J, Lewis J, Nicholls CM, Ormston R. Qualitative research practice: A guide for social science students and researchers. Thousand Oaks, CA: Sage, 2013.

22 Francis JJ, Johnston M, Robertson C, Glidewell L, Entwistle V, Eccles MP, *et al*. What is an adequate sample size? Operationalising data saturation for theory-based interview studies. Psychol Health 2010; 25: 1229–45.

23 Anderson K, Stowasser D, Freeman C, Scott I. Prescriber barriers and enablers to minimising potentially inappropriate medications in adults: a systematic review and thematic synthesis. BMJ Open 2014; 4: 1–8.

24 Anthierens S, Tansens A, Petrovic M, Christiaens T. Qualitative insights into general practitioners views on polypharmacy. BMC Fam Pract 2010; 11: 1.

25 Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care 2007; 19: 349–57.

26 Adams WL, McIlvain HE, Lacy NL, Magsi H, Crabtree BF, Yenny SK, *et al*. Primary care for elderly people: why do doctors find it so hard? Gerontologist 2002; 42: 835–42.

27 Braddock CH 3rd, Snyder L. The doctor will see you shortly. The ethical significance of time for the patient–physician relationship. J Gen Intern Med 2005; 20: 1057–62.

28 Bradley F, Ashcroft D, Noyce P. What key components are required to improve pharmacist–GP collaboration? Pharmaceut J 2012; 289: 608.

29 Pearson SA, Moxey A, Robertson J, Hains I, Williamson M, Reeve J, *et al*. Do computerised clinical decision support systems for prescribing change practice? A systematic review of the literature (1990–2007). BMC Health Serv Res 2009; 9: 154.

30 O'Connor MN, Gallagher P, O'Mahony D. Inappropriate prescribing: criteria, detection and prevention. Drugs Aging 2012; 29: 437–52.

31 Gallagher P, O'Mahony D. STOPP (Screening Tool of Older Persons' potentially inappropriate Prescriptions): application to acutely ill elderly patients and comparison with Beers' criteria. Age Ageing 2008; 37: 673–9.

32 O'Sullivan DP, O'Mahony D, Parsons C, Hughes C, Murphy K, Patterson S, *et al*. A prevalence study of potentially inappropriate prescribing in Irish long-term care residents. Drugs Aging 2013; 30: 39–49.

33 Castillo RS, Kelemen A. Considerations for a successful clinical decision support system. Comput Inform Nurs 2013; 31: 319–28.

34 Jin M, Naumann T, Regier L, Bugden S, Allen M, Salach L, *et al*. A brief overview of academic detailing in Canada: Another role for pharmacists. Can Pharm J 2012; 145: 142–6.

35 Maltais R, Schmidt T, Chhina H, Mazowita G, Marra C, Tugwell P, *et al*., eds. Academic detailing to optimize care for RA by family physicians – results of a satisfaction survey. J Rheumatol 2014; 41: 1495–6.

36 Lowrie R, Lloyd SM, McConnachie A, Morrison J. A cluster randomised controlled trial of a pharmacist-led collaborative intervention to improve statin prescribing and attainment of cholesterol targets in primary care. PLoS One 2014; 9: 1–2.

37 Avorn J, Soumerai SB. Improving drug-therapy decisions through educational outreach. A randomized controlled trial of academically based 'detailing'. N Engl J Med 1983; 308: 1457–63.

38 Patterson SM, Cadogan CA, Kerse N, Cardwell CR, Bradley MC, Ryan C, *et al*. Interventions to improve the appropriate use of polypharmacy for older people. Cochrane Database Syst Rev 2014; (10): 1–81.

39 Riordan DO, Walsh KA, Galvin R, Sinnott C, Kearney PM, Byrne S. The effect of pharmacist-led interventions in optimising prescribing in older adults in primary care: a systematic review. SAGE Open Med 2016; 4: 1–8.

40 Duncan EM, Francis JJ, Johnston M, Davey P, Maxwell S, McKay GA, *et al*. Learning curves, taking instructions, and patient safety: using a theoretical domains framework in an interview study to investigate prescribing errors among trainee doctors. Implement Sci 2012; 7: 1–3.

41 Birt L, Scott S, Cavers D, Campbell C, Walter F. Member checking: a tool to enhance trustworthiness or merely a nod to validation? Qual Health Res 2016; 26: 1802–11.

Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

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Appendix S1 Example of topic guides
Appendix S2 Table of consolidated criteria for reporting qualitative studies (COREQ) checklist