TITLE: The future of pharmacy practice research – Perspectives of academics and practitioners from Australia, NZ, United Kingdom, Canada and USA

ABSTRACT

Introduction: Healthcare is under significant pressure with the explosion of long term conditions, shift in worldwide demographics and is evolving through advances in technology. Aligned with this is the changing role of pharmacy from the traditional dispenser of medicines to having (in addition) a more advanced clinical role. This study aimed to understand what the pharmacy practice research agenda might look like from the viewpoint of pharmacy academics and practitioners across five high-income countries.

Method: Qualitative methods were used and thirty one-hour interviews were undertaken with practitioners and academics from five economically advanced countries. These nations have comparable socio-economic status but differing health systems and include; Australia, Canada, New Zealand, United Kingdom and United States of America. Six key informants were chosen from each country, three academics and three community pharmacists. A general inductive analysis was undertaken to analyse the most common and recurring themes.

Results: These themes of research were based around current community pharmacy practice issues and the enablers to changing the profession. Specific areas pharmacy practice could be more involved with included; care of the elderly population, mental health, and specialty care for the population with multiple co-morbidities. Some community pharmacists also felt research into the impact of professional standards and policy change would be beneficial. The findings of this research suggest that current pharmacy practice research methods are sufficient, but need to be used more effectively.

Conclusion: Participants identified a wide range of issues within community pharmacy practice. Academics largely focused on how research can be utilised in the community and how to implement findings to ensure sustainability of pharmacy practice research. Issues that community pharmacists would like to research are related to the current practice model, such as allocating time to provide all the patient focused services on top of managing a business.

INTRODUCTION

Worldwide, the population is growing, ageing and changing. A World Health Organisation report (2015) highlighted these changes in demographics; the proportion of the world's population over the age of 60 is growing at a higher rate than any other age group and is predicted to more than double by the year 2050, from 901 million in 2015 to 2.1 billion. This shift in the demographic can in part be attributed to success in healthcare, including advance in technology, nutrition and lifestyle, which in turn has enabled people to live longer (1, 2). This has resulted in more people with long term health conditions, some of whom are better informed, due to their ability to research health information via the internet. In parallel, medicines use and healthcare delivery are also evolving; this is also reflective to some degree upon the long term conditions that are increasing, and the rapid changes in the use of technology (2). In addition, as the world's population is more mobile than ever before and thus more multicultural; there is concern over health disparities within the subsequent minority populations (2-5).

Together, these changes have an effect on healthcare demand and the potential to impact the way medicines are used, the policies regarding medication use, the delivery of healthcare and the provision of services in the pharmacy (10, 11). The increased demand on primary health care services (6) have led to a strain on the primary health care workforce (7-10). In order to overcome such challenges, primary health care systems have evolved to encompass new services and, in many countries, extended roles for community pharmacists (11-13).

Pharmacists are medication experts and are a vital member of the healthcare team; they have an important role to play in the delivery of primary care in the community (2, 14). Community pharmacists have been described as the most easily accessible healthcare professional and a community pharmacy is a common point of contact for patients to access medicines and healthcare advice (2, 15). Effective medicines management and the expanding roles of pharmacists must be coupled with a well-organised technology infrastructure, professional training and ethical, legal and regulatory frameworks (16).

In an evidence-based health service, it is vital to show evidence of benefit to support these changing roles and perceptions of the pharmacist (17, 18). Due to the increasingly integrated nature of pharmacy within the healthcare profession, practicing pharmacists need to actively participate in research in order to reflect on the relevancy of the services they deliver, to help discover new areas that may require research, and to firmly establish

the necessity of the profession (2). For this reason, it is vital to evaluate what community pharmacy practice may look like in the next 20-30 years and the types of questions that might need answering by pharmacy practice researchers.

The aim of this study was to understand what a future community pharmacy practice research agenda might look like from the viewpoint of pharmacy academics and practitioners. Specifically, to compare and contrast the perceptions of academics and practising pharmacists, in addition to exploring new methods which may be used in the future by pharmacy practice researchers.

METHODS

Study design and participant selection

This study adopted a qualitative approach using semi-structured exploratory interviews between June and October 2015 via telephone, Skype or face-to-face meetings. Ethical approval for the study was gained from the University of Auckland Human Participants' Ethics Committee (Reference: 014653). Purposive sampling was used to select community pharmacists and academic pharmacy researchers from Australia, Canada, New Zealand, the UK and USA. Participants within these countries were selected due to the country's similar socioeconomic standing. Selection criteria for academic participants included prior sector knowledge of researchers working in academia and identifying individuals who had previously published articles relating to community pharmacy practice. For community pharmacist participants, selection was from those actively posting about their work on social media platforms such as LinkedIn and Twitter. Additional participants were also identified using a snowball sampling strategy following recommendations made by interviewees.

When identified, participants were contacted via email to introduce the study and were invited to participate. If the participants replied with interest, a participant study information sheet explaining the purpose of the research and their role within it was sent, along with a research consent form and the semi-structured interview guide. For those agreeing to participate in the study and who returned a signed consent form, an interview was arranged at a convenient time.

Development of Interview Schedule

The purpose of the interview was to identify research themes that pharmacy practice academics and community practitioners thought should be explored in order to inform a future community pharmacy research agenda. A semi-structured interview guide was developed for this purpose, following a review of the literature which consisted of six key areas to be explored (see Table 1). The guide was piloted using two individuals, one an academic, the other a community pharmacist, and refined prior to conducting the main interviews. The schedule was designed to establish an overview of current community pharmacy practice and community pharmacy practice research from each participant before enabling exploration of any emerging themes as the interviews progressed.

Six sections of the semi-structured interview guide		
Sections	**Including:**	**Literature-derived themes to inform interview**
1 Community pharmacy practice in their respective countries	a) Situation b) Issues	• The perception of the role of the pharmacist in the provision of care, • Transition of the profession • Lack of resources • Pharmacists' collaboration with other healthcare professionals
2 Community pharmacy practice research	a) Issues with research b) Explanation on why they see these as issues	• Lack of awareness, time and resources • Lack of a research agenda • Lack of funding
3 The enablers of pharmacy practice research	Impacts of: a) Consumers b) Technology c) Demographics d) Education and professional standards	• Impact on funding • Use of mobile technologies and databases on service delivery • Ageing population Ethnicity and migration Language barriers • Integration between researchers and pharmacists Link to service provided to patients
4 The impact of pharmacy practice research	a) Research required to change policy b) Research used in past that worked and was useful	• Using evidence-based research and implementing it into practice
5 Future of pharmacy practice and associated research	a) Key to sustained pharmacy practice b) Views of the future of pharmacy practice research c) Factors that may influence pharmacy practice research on a global level	• Collaboration, use of electronic health records continued learning for pharmacists • Collaborative research, proving value of services • Value of pharmacist in the primary care team, pharmacist communication • New, innovative models of care, Global workforce
6 Methodologies used in practice research	a) Sufficiency of current methodologies b) Any new methods and models that may emerge c) How they may impact practice research	• Sufficiency dependent on research question • Use of technology, application of existing methods from other disciplines • Stronger research

Table 1: Overview of the six themes in the semi-structured interview guide and the resulting themes that emerged.

Data analysis

All interviews were audio recorded and transcribed verbatim by the interviewer. This allowed for familiarisation with the data and initiated an informal coding process with the emerging themes. The transcripts were entered into QSR NVIVO 10© for categorical coding according to the questions asked in the interview. Pre-determined parent nodes were set up to align with the six areas to be explored in the interview guide. Child nodes were created based on the questions asked in each category. Further sub-nodes were assigned according to similarity of emerging themes. Transcripts and codes were checked by the supervising academic to ensure the quality and accuracy of the data.

RESULTS

Study participants

Seventy-seven participants were approached about this study; 38 academics and 39 community pharmacists. A total of 30 individuals were interviewed for this study. This included 15 academics and 15 community pharmacists, three from each category in each country. The interviews were conducted via telephone, Skype™ or in person. All interviews were digitally recorded and transcribed verbatim by the research team. The completed transcriptions were read over, checked, and then sent to the participants for feedback. They were given one week to check and revise the transcripts. All revised transcripts and transcripts which were not sent back by the deadline were entered into the NVivo 10 (QSR International Pty Ltd) software package for the qualitative data analysis phase.

Main themes

Participants were asked the questions outlined in the semi-structured interview guide (table 1). Pre-determined themes that formed the basis of the interview questions were discussed and emergent sub-themes from this dialogue were categorised according to each section of the guide. An overview of the literature derived themes can be seen in table 1. Further details and evidence for these themes and sub-themes are described in tables 3-8.

Country		Gender	Academic Rank	Approximate publication category as of year of interview*	Independant versus chain pharmacies
New Zealand	Academics	2F, 1M	2 AP/Ps, 1 SL/L	1 x Category 2; 1 x Category 3 and 1 Category 4	-
	Community pharmacists	1F, 2M	-	-	1 independent, 1 chain and 1 both CPs
Australia	Academics	2F, 1M	2 AP/Ps, 1 SL/L	1 x Category 2, 1 x Category 3 and 1 x Category 4	-
	Community pharmacists	1F, 2M	-	-	2 independent and 1 chain CP
Canada	Academics	3M	2 AP/Ps, 1 SL/L	1 x Category 1; 1 x Category 2 and 1 x Category 4	-
	Community pharmacists	1F, 2M	-	-	3 independent CPs
UK	Academics	3F	3 AP/Ps	1 Category 3 and 1 x Category 4	-
	Community pharmacists	1F, 2M	-	-	3 independent CPs
USA	Academics	2F, 1M	3 AP/Ps	1 x Category 1, 1 x Category 2 and 1 x Category 3	-
	Community pharmacists	2F, 1M	-	-	1 independent and 2 chain CPs

Table 1: Characteristics of participants. Associate/Assistant Professor/Professors = AP/P; Senior Lecturer/ Lecturer = SL/L (or equivilant). Community Pharmacy = CP

* Categories of publication history = Category 1 <25; Category 2 26-50; Category 3 51-150; Category 4 >150

Issues relating to community pharmacy practice

There were four themes raised by participants as key issues surrounding community pharmacy practice. These were (1) the perception of the role of the pharmacist in the provision of care and how it could be a barrier in moving the profession forward, including the consumer's view, (2) the transition of the profession -- moving from the role of the dispenser to a service-based model, (3) a lack of resources and (4) the collaboration of pharmacists with other healthcare professionals. These themes are explored below.

Table 3: Themes that emerged from the discussion surrounding community pharmacy practice

Theme	Explantory note	Evidence
(1) Perceptions of the role of the pharmacist in the provision of care	The perception of the role of the pharmacist could be a barrier in moving the profession forward.	*"There are always big public relations questions among the pharmacy associations because people don't understand what we do and how we do it and what goes on behind the scenes."* [CP6-USA] *"...whether they are just a retail outlet or they are a primary care provider."* [CP1-Australia]
	Perception and understanding of the role of the profession by consumers.	*"... pharmacists are trusted a lot of times but this does not necessarily translate into understanding what pharmacists can do"* [A4-Canada].
(2) Transition of the profession- moving from a dispensing model to a service-based model	Participants agreed the need for a new pharmacy model based on the delivery of pharmaceutical care to patients. Many suggested that this could be enabled further by having a team of competent technicians in dispensing roles so that pharmacists could provide these services.	*"...dispensing on its own is not going to be sustainable and that there needs to be an acceptance of the need to provide services that are quality-based, that are evidence-based..."* [A3-UK]
	More robust and broad research is needed to be carried out before it can be implemented within existing healthcare models.	*"...there's a lot of places where evidence is lacking for pharmacy."* [CP9-Australia]
	Many participants believed the profession will move forward to a more clinical role but the problem is whether pharmacists will take the opportunity to become more involved, even when this change is implemented as part of the expanded scope of practice.	*"Pharmacists are notorious for whining and complaining about not being able to do things and then when given the opportunity to do it, they don't."* [A5-Canada]
	Another factor that could affect the transition of the profession is whether the profession has leaders to strongly advocate for change. A few participants identified this as a barrier.	*"...if you ever needed a time for clear and effective leadership is now because what I think the profession needs is a strong voice, a very confident voice, and you know, leadership becomes critical."* [A6-NZ]

	Pharmacists feel that this service model is the best approach for the future of pharmacy practice because in the past the dispensing model was based around an acute care setting but as the population ages and patients are faced with multi-morbidity, this shift to a more supportive and problem-solving role through the provision of clinical services is needed.	*"...that is a big problem with regards to medicine use for the community is particularly around multi-morbidity and the treatment of things that go along side in an aged population....pharmacy needs to be in that space that's not a dispensing space, it's about solving the problems of multi-medicine use." [A3-Australia]*
(3) Lack of resources	Although there was agreement that the model of care should be more service-based, participants identified that funding for the provision of services may be limited. The responses varied based on the model of care in that particular country.	*"I guess the other thing is that the NHS is a bit cash-strapped at the moment so it is difficult to get some services commissioned, both nationally and on a local level as well."* [CP1-UK] *"I think that depending on how insurance works...there won't be too many services involved because it costs so much money." [CP 2-USA]* *"...they want to know what's it gonna, how it's gonna impact the budget. So if it's gonna save in-patient days, so we use less beds then you need to show that. It can't be just the clinical outcome, but how's it gonna save money in the long run." [A4-Canada]*
	Also a NZ community pharmacist identified that the lack of time pharmacists have available limits the services provided in pharmacies.	*"...we probably need to be in a position where we really should have time for it… " [CP5-NZ]*
(4) Pharmacists' collaboration with other healthcare professionals	Both academics and community pharmacists were concerned about the implications of providing more clinical services on the work of other healthcare professionals. However, they did agree that collaboration with general practitioners was needed to streamline patient care.	*"I think there's a fear of just doing it and moving forward… they don't want to upset doctors and I don't think the doctors are really going to be upset if pharmacists are active and doing things." [A1-UK]* *"... when we start to change what we do, are we going to tread on anybody else's toes?"* [CP5-NZ]
	Participants agreed that there needs to be a seamless co-operation with other health professionals.	*"...[without cooperation, patients will] end up back in the hospital within the first week so they you know end up spending more money than what they would spend on one or two weeks medication supply" [CP7-Canada]*
	A participant also stated that to provide better care there is a need to access patient records and information to get a complete profile on the patient, which requires complete cooperation between different healthcare professionals.	*"I believe we should have access to patient's profile or their entire profile for last year or so… so that we can manage their care better" [CP7-Canada]*

2. Issues relating to community pharmacy practice research

Three main themes emerged as key issues related to community pharmacy practice research. These were; (1) a lack of awareness, time and

resources, (2) lack of a research agenda and (3) a lack of funding.

Table 4: Themes that emerged from discussion surrounding issues relating to community pharmacy practice research

Theme	Explantory note	Evidence
(1) Lack of awareness, time and resources	Participants identified a lack of integration between community pharmacy practice and practice research. Academics thought that there needed to be more of a research culture within community pharmacy but community pharmacists expressed that they didn't have time for it beyond their current responsibilities.	*"I think most community pharmacies, they're not necessarily what we call research ready."* [CP3-UK] *"I think a big issue is actually getting people to participate."* [A5-Canada] *"I think the major issue is definitely the time, lots of pharmacists do not have time and resources to think or initiate a research project or think about doing a research project."* [CP1-Australia]
(2) Lack of a research agenda	Participants stated a lack of a research agenda, which is needed to facilitate futire community pharmacy practice research. Academics mentioned the need for multidisciplinary collaboration.	*"I believe that there should be a call and some sort of agreement…where we can get top researchers and top policymakers to agree on an agenda and come together on that rather than the very fragmented nature in which we see in now."* [A2-USA]
	Participants felt that in order for the profession to grow and change there needs to be evidence to show that pharmacists are making a difference, otherwise the government will not be interested in funding and developing services further.	*"... if we can't show that it is providing some kind of benefit, then, if we are looking for funding for that service from the government we will be challenged about why we are providing that service when it is not really having any impact."* [A2-NZ] *"...some aspects of research you see around the clinical aspects but I don't think there's any or barely any research that is pharmacy specific and around the interaction, the social interaction between the pharmacy, the pharmacist and the individual. So, there's just very little quality research that is going out and assessing whether or not the pharmacist is doing a good job with that patient."* [CP3-NZ]
(3) Lack of funding	Participants thought that there was a lack of funding for pharmacy practice research.	*"... funding, because at the moment, a lot of community pharmacy practice research is not of a sufficient calibre in terms of scope or design to be considered as evidence in the NHS."* [A4-UK] *"So, you can only do that by pretty massive investment and that's got to come from the profession, it's got to come from the funders…"* [A6-NZ]

3. Enablers to pharmacy practice research

The four enablers of pharmacy practice research were consumer involvement, technology, patient demographics and education and

professional standards were discussed with participants. Key themes identified can be seen in table 4 below.

Table 5: Themes that emerged from discussion surrounding enablers to pharmacy practice research

Theme	Explantory note	Evidence
(1) Consumer involvement	Importance of consumer opinion	*"...obviously patients' involvement is vital, because we can think of all sorts of wonderful things to do but if our patients either don't want it or don't appreciate it, what's the point?"* [CP4-UK] *"I think not all research needs to involve participants...but I think certainly some of it should. Particularly if it involves pharmacist roles in public health..." [A2-USA]* *"Well consumers have to be involved because consumers are the ultimate beneficiaries or recipients of any change ... So they're absolutely crucial and you can't do this sort of research without involving consumers..." [A6-NZ]*
	Impact on funding	*"...any work that is being funded by the major funding bodies has to have patient public involvement (PPI) and many organisations will not fund research grants unless PPI has been considered." [A3-UK]*
(2) Technology	Need for technology	*"Without technology, we are handicapped." [CP5-USA]*
	Use of mobile technologies for service delivery	*"[Tele-pharmacy] could certainly transform practice and would enable pharmaceutical care to be delivered in all sorts of environments where currently they don't have a pharmacist and where it wouldn't be affordable for there to be a pharmacist." [A4-UK]*
	Use of databases= benefits of access to electronic patient health records	*"I think that if we're going to be asking pharmacists to be providing more clinical services, having access to that information is a no brainer, you have to do it otherwise you can't make recommendations to that patient."[A6-USA]*
	Concerns about access to records= need for consent & sensitivity	*"...there might be a trust element that community pharmacies, without explicit consent of each patient" [CP3-UK]* *"However, issues regarding privacy and utilisation of these information, with / without the consent of the patient, need to be considered prior, and the ability to use these information will definitely affect how board pharmacy practice research can get to." [CP8-Australia]*
(3) Changing demographics	Effect on service delivery	*"...if the services that are needed are going to be quite different to what's currently available, we want to be able to generate the evidence to show that the new services to be put in place are going to deliver on what is actually required." [A3-UK]*
	Effect of ethnicity and migration on sample data	*"...say if you look at ethnicity for example, the behavioural elements that you have to apply, say to somebody from one culture to another culture, is very different so you'd have to take into account that when you're doing your research..." [A1-Australia]*
	Language barriers	*"It's ok you know, buying your loaf and potatoes from the supermarket and not being able to communicate effectively, but it's important, in fact vital for healthcare advice that is understood correctly and that the healthcare professional giving the advice is confident that the patient understands it." [CP4-UK]*

	Effect of an ageing population	*"An ageing population would be another driver for care to be delegated from doctors to other healthcare professionals, including pharmacists." [A4-UK]* *"expansion of the population in general will mean that there is more need [for patients] to have the access to medical care including pharmaceutical care." [A5-USA]* *"...there's a huge investment of money with aging population. So it won't really affect your research agenda because you are keeping track of that anyway." [CP9-Australia]*
(4) Education and professional standards	Lack of exposure to pharmacy practice research	*"I don't think professionals generally in the past have actually been able to be exposed to that much research." [CP3-UK]* *"Having the students exposed to practice research while they're still in school would help to promote further research and further involvement into research when they get out to practice." [A5-USA]*
	Integration between researchers and pharmacists	*"... I think we need research aware individuals in the profession who are able to appreciate why research is important."[A3-UK]* *"I think we've got to develop clinical academic careers for people like doctors have. There's a whole clinical academic structure for other health professionals but not for pharmacists…we've got to have those leaders who are half in practice and half not, like the medics are." [A1-UK]*
	Link between education and the service provided to patients	*"the number of hours spent on studying medicines actions needs to be emphasised more." [A4-UK]* *"We expect things to change, so and that only comes from education… so continuing education is really important for changing the way." [CP3-NZ]* *"...we know when they graduate that they have these skills. How quickly those skills deteriorate ..." [A5-Canada]*
	Professional standards	*"I think one can always evaluate the extent to which professional standards are being adhered to and one can use, utilise or gauge the quality of care to determine and inform the professional standards." [A2-USA]* *"... if professional standards change we might want to evaluate them to make sure that they do the job and so in that case professional standards might drive the practice research." [A3-Australia]*

4. Impact of pharmacy practice research

Participants commented on important drivers for policy change and how they could be used by researchers in the future. Most participants in all countries emphasised the importance of having strong evidence-based research to drive meaningful policy change. They also spoke about how evidence of cost-effectiveness and better healthcare outcomes were important. Participants in the UK commented on research conducted to show the effectiveness of the New Medicine Service and how that influenced policymakers to continue funding the service. They thought that it was important to show that the intervention worked and saved money. Participants in the USA commented on the Affordable Care Act and how that came into federal legislation. They mentioned that it was useful to have good advocacy which was important when influencing policy-makers to make changes. Participants made various suggestions for future research areas. Many of the participants from the UK thought that it was important to assess the quality and impact of services on patient and health services outcomes.

Table 6: Themes that emerged from discussion surrounding impact of pharmacy practice research

Theme	Explantory note	Evidence
(1) Impact of pharmacy practice research	Strong evidence needed	*"If you want to know whether or not one service is better than another service, you would do a randomised controlled trial. If you're interested in people's attitudes or views which would go on to inform evidence and policy, then you're probably talking about a cross-sectional survey or qualitative work." [A3-UK]* *"... bureaucrats, and department of health…they don't really care unless it's doing two things; improving health for the patients and improving access, and decreasing cost. So if there's no reducing cost in emergency room visits, they don't really care. That is the ugly truth of it."[CP2-Canada]*
	Using the evidence in practice	*"given that each state has their own regulations and procedures… some states are lagging behind to embrace the results of the research…." [A5-USA]* *"Warfarin I'd say was one that worked, because it was funded at the right level. It was initiated by a government body… it had all sorts of barriers of getting ongoing funding…"[CP5-NZ]*
	Future pharmacy practice research areas	*"...we have to prove that what we do does the patient good and it saves the NHS money and make it more efficient." [CP4-UK]* *"...chronic disease management, how pharmacists can impact the chronic diseases management is probably the biggest area that we need to focus on."[CP2-Canada]*

5. Future of pharmacy practice and pharmacy practice research

Ideas for future practice and pharmacy practice research were offered by participants. Academics and community pharmacists provided similar opinions on what they thought would be important in the future across four thematic categories; (1) Key to the future of sustained pharmacy practice (2) How the future of pharmacy practice research will pan out (3) Issues to be researched in the future and, (4) Global impact on the future of pharmacy practice research. These are presented in the table below. Many ideas for future practice were elaborations of those identified as key issues in Section 1 of the results.

Table 7: Themes that emerged from discussion surrounding Future of pharmacy practice and pharmacy practice research

Theme	Explantory note	Evidence
(1) Key to the future of sustained pharmacy practice	Most participants felt that future community pharmacy practice would involve pharmacists providing a clinical service integrated with other primary care professionals by using electronic patient records to ensure services delivered are tailored to support each patient in the management of their care.	An academic from the USA elaborated on this by saying better streamlining of care which would put the patient more at ease. They said it should be: *"just a given that if you need an adjustment on your prescription then you can get that adjustment in your prescription without having to go all they way to your physician and come all the way back to that pharmacy again." [A6-USA]* *"future was not sticking tablets in bottles, the need for us to do that as pharmacists is long gone we have machines that can do everything. Robotics at whatever level are going to influence every profession, every business, and*
	Participants also talked about how crucial it was to educate pharmacists so they were adaptable to embracing change.	*"being able to keep up with the continuing education and learning what is needed in the pharmacy practice in the current day and in the future is vital in order to survive." [CP2-USA]*
(2) How the future of pharmacy practice research will look	Academics in particular thought that the future would involve a more multidisciplinary approach to pharmacy practice research because collaboration would secure better funding. They also believed that it was important to prepare researchers that were appropriately trained in pharmacy practice research.	*"In terms of pharmacy practice research, I think there needs to be the availability and commitment to good training and people being trained in appropriate methodologies and doing work in a rigorous and robust way." [A3-UK]* *"...my hope is that the findings from pharmacy research are integrated into curriculum and advocacies and organisations would actually advocate on that basis." [A5-Canada]*
	Some community pharmacists emphasised the need for more evaluations to show the effectiveness of changes occurring in pharmacy practice but many were concerned about the feasibility of getting involved in research.	*"I think we need to develop new ways of measuring and also more effective ways of measuring things so we can demonstrate its value." [CP3-UK]*

(3) Issues to be researched in the future	Some participants felt that they had already answered this question (section 4.3). Those that responded stated they would like to see research on the impact of a multidisciplinary approach to delivering healthcare as well as other community pharmacy services.	*"I'm sure lots of people will be evaluating how professions collaborate and integrate and work together. And whether it will be genuinely a benefit or if this leads to benefit for the patient."* [CP3-UK] *"minor ailments services, so really just, providing OTC advice, primary care advice."* [A7-Australia] *"I think my priority in research right now is looking at getting pharmacists to use their clinical ability"* [A8-NZ] *"...older people and their medicines, that would be my number 1."* [A2-NZ]
	One pharmacist said that it was important to prove the value of having a pharmacist in the primary healthcare team	*"I like to think there is an opportunity for us as healthcare professionals to demonstrate that in addition to the supply function, we can actually add lots of value and lots of important interventions into patients' healthcare, conditions and lifestyles, because at the end of the day pharmacists are clinicians."* [CP4-UK]
	Another academic thought that integrating community pharmacists into research was another issue to develop further.	*"I also would like to do some more work in how researchers communicate with pharmacists and what we could do a better job of."* [A6-USA]
(4) Global impact on the future of pharmacy practice research	Although participants agreed that pharmacy practice meant different things in different countries, they were hopeful of a more internationally collaborative approach in the future which could bring some innovative models of care. Many academics indicated the importance of a global workforce within the field because they felt that there was a shortage of pharmacy practice researchers worldwide. Academics and community pharmacists from the USA talked about looking at international practice and research conducted globally that could influence their future scope of practice.	*"I think there's advantages for people, especially in the US to learn from the mistakes that other people have made so that they don't make those same mistakes themselves as they're expanding the scope of practice in their own home country."* [A6-USA]

6. Methods related to pharmacy practice research

Participants were asked for their opinions on current and new methods or models that could be implemented in pharmacy practice research.

Most community pharmacists struggled to answer these questions as many of them had not been involved in research.

Table 8: Themes that emerged from discussion surrounding Methods related to pharmacy practice research

Theme	Explantory note	Evidence
Current methods being used	Most academics agreed that methods used to conduct pharmacy practice research should be selected specifically to address the research question being asked.	*"I think it's not so much about the current methodologies, I think it needs to be; what are the questions, how do we answer those questions and then at that point, if we're not familiar with the methodologies we need to learn about them." [A3- UK]* *"So there's a room to look beyond survey and interview research methodologies in doing pharmacy practice research." [CP9-Australia]*
	However, many community pharmacists found it difficult to answer this question as they were not familiar with research techniques.	*"I'm not sure about the methodologies unfortunately." [CP2-USA]* *"once the pharmacists start practicing community pharmacy…our brain sometimes gets shut down from the research thing…" [CP5-USA]*
New methods or models employed to conduct pharmacy practice research	Many participants thought that new tools such as advances in technology could influence the way in which pharmacy practice research could be conducted. Participants from the USA also talked about technology	*"I think that technology can enable a substantial change in how research can be conducted in this era…" [A5-USA]* *"it'll just speed things up."* *"…now the research is becoming much faster. You could easily get an app out there at a cheap, affordable price, and you know you can collate a lot more data, at a much more cost effective way." [CP2-Canada]*
	Participants also talked about a multidisciplinary approach to conducting research. This could also identify methods used in other disciplines that could be relevant to pharmacy practice research.	*"I don't think it's a case of just fetching a new research method or developing these, I think it's a case of maybe trying to research a method which is out there, existing in the world but applying it to pharmacy practice." [CP3-UK]*
	Academics also mentioned that new models are not often proposed by researchers but:	*"I think what we have to do is to make sure we are always in touch with what you might call the cutting-edge approaches in health service generally and make sure we adopt them as soon as we can in pharmacy practice research." [A4-UK]*
Impact of new methods on future practice	Not all participants were able to answer this question in detail but there was agreement that the new methods would better inform and impact future practice.	*"I think you should get stronger research." [A4-UK]* *"…you will have more robust data, so you will have more reliable information coming out research. You will have more material to your argument." [CP9-Australia]*

DISCUSSION

This study set out to explore an area that is under researched -- what a community pharmacy practice research agenda could look like for the future; from the viewpoint of academics and practitioners. Participants were able to provide their view on the current situation in community pharmacy within their respective countries and also discuss the enablers and barriers to moving the profession forward. Subsequently, this study also allowed the exploration of ideas on how this could be achieved by researchers.

It has been suggested that the pharmacy profession could provide an accessible healthcare professional for the consumer (19), especially as budget-cuts and increases in the population requiring medical treatment are putting strains on healthcare delivery (20). According to George and colleagues (2015) a future research agenda must be based on the future care model, which is changing to support patients in the acute and chronic management of their disease (21). As the pharmacy model is moving from one of a primarily dispensing role to one of a service-based model based on clinical activity, we must also consider the potential services. Services offered must include support for healthy living and conducting medication reviews (22).

This study highighted potential enablers and barriers to this expanded role. Community pharmacists felt that the general public did not understand what the pharmacist did outside of dispensing. This was also identified in a pilot study conducted in the UK where consumers had a lack of understanding of the expertise of a pharmacist and were therefore less supportive of the expanding role of the pharmacist (23). Promotion of the skills held by the pharmacy profession would be one way to overcome this lack of understanding. This promotion should advocate for the management and delivery of pharmaceutical care, particularly the benefits of pharmacists being accessible to the community. Consumer involvement in research was also advocated for by participants in our research; a notion reinforced by numerous influential bodies; being strong advocates for consumer roles in public health research (24).

Resources are essential in the transition to the service-based model; whether this be time, funding or compensation. Without adequate funding, implementation of pharmacy services is limited. Many community pharmacists identified time as a barrier to providing quality services, this is something that was also found by Jorgenson et al (18). In this current study, participants felt that having competent technicians that could do the bulk of dispensing and the introduction of new technologies such as robot dispensing

could free up their time to provide clinically oriented services. This has been suggested previously by Smith et al (22). Our participants also thought that more collaboration within the primary care team such as with general practices could re-distribute workload and enhance patient care, particularly in the management of patients with long-term conditions who may be on a number of medicines. Evidence of potential benefit was seen in the UK with the medicines reviews being completed in pharmacies (25). In addition, the potential for pharmacist services in regards to triage in community pharmacies was described in a systematic review by Curley and colleagues (2016) (13).

It is important to understand how pharmacy practice research could facilitate these changes in practice and support progression of the profession in the future. These ideas could therefore be the basis of a future research agenda. Academics across countries shared a concern that there was a lack of pharmacy practice research in general and that it was fundamental to have research as evidence to underpin changes in practice and support whether there was a benefit to the patient. Participants thought that in order to generate strong research, it was important to have a competent and willing workforce who could address the research needs of the population and adapt their work to generate the evidence required to inform future policy and evaluate practice. In addition, in order to ensure that there is the maximum uptake of the outcomes of this research, it needs to be multi-disciplinary.

Evidence to support the expanding role of the pharmacist is growing; key questions still need to be explored, such as, whether the pharmacist is the ultimate barrier to practice change (26). Our study partcipants also highlighted this; suggesting many pharmacists may not take up the opportunity to embrace an expanded role. Studies conducted in NZ recognize that pharmacists themselves need to make attitudinal changes and change their culture (27-29) in order to implement a Vision (30) of new roles and integrate within primary healthcare teams (31). They need to be supported to do so (32) through new funding models (33). In order to bring about this change in the profession, leaders are required to strongly advocate for this transition of the profession. Tsuyuki et al. believes the role of leadership is important in facilitating the growth and evolution of the profession and leadership from all levels, from organizations to individual pharmacists will lead to change in pharmacy practice (34).(35)(35)

Another major barrier that was highlighted was funding; academics in particular emphasised the need for sufficient funding for this research. Funding needs to support

high quality research, to conduct studies such as randomised controlled trials or service evaluations, especially with large data. This could be achieved by collaborations with researchers across disciplines, including but not limited to economists, social scientists and other healthcare professionals. Not only would this add value to the research with the collective expertise, it would also give more incentives for policymakers to allocate funding into the research and ensure that professional bodies are aware of the benefits that pharmacy practice researchers bring to improving health outcomes. An example of this approach can be seen in the study by Snyder and colleagues where mixed methods were used by a team of researchers from different health-related backgrounds to explore successful community pharmacist-physician collaborative working relationships (36).(37)

Most of the academics and community pharmacists interviewed thought that it would be beneficial to integrate research into practice, which could be achieved by encouraging community pharmacists to get more involved in research themselves. However, this comes with its own barriers; time and lack of experience were both expressed in this study. Previous work has also highlighted this perception; pharmacists felt that they didn't know enough about research or they were concerned that they wouldn't have time to conduct it in addition to other work they were required to complete (38). Aiding communication between academics and community pharmacists via means such as conferences or education sessions, promoting the benefits of pharmacist participation could be one step to achieve this. An interesting approach conducted in Australia to encourage engagement of community pharmacists in research was to incentivise the system. This was achieved by incentivising the national service model, where community pharmacists were given additional funding for engaging in research (39), albeit the outcomes havent been reported yet.

Participants identified a wide range of issues within community pharmacy practice they would like to conduct research on. Academics largely focused on how research can be utilised in the community and how to implement findings to ensure sustainability of pharmacy practice research. A minority of academics would like to focus on how pharmacists use their clinical knowledge in the community setting, how they provide advice with over the counter treatments, and also how specific populations take their medications.

(40)(40)(40)(40)On the otherhand the issues that community pharmacists would like to research are related to the current practice model such as allocating time to provide all the patient focused services on top of managing a business. Some pharmacists would like to see a practice model which does not involve making a profit out of delivering pharmacy services. Whereas, other community pharmacists would like to focus on the issues they see every day within the community setting such as efficacy of extemporaneous compounds, the impact of pharmacist's advice on the health of patients and also issues related to chronic disease management and medication use.

Academics agreed that the method selected depended on the research question being asked. It would therefore be the responsibility of the research team to choose the most appropriate method to conduct their study effectively. (41)Many agreed that advancement of technology, particularly the use and access to large electronic datasets, could be a new method to utilise when conducting research, which has been reported elsewhere (42). With the introduction of the electronic prescription service in the UK for example, there could be the opportunity to utilise this data and evaluate its effectiveness for users (43).

In the case of our research we wanted to explore the general question of research in the pharmacy practice field, the next step would be to undertake research that is more focused on a narrower theme, allowing more interviews to be undertaken. The themes identified in this study could be used as the basis of future research. This could be used to identify new themes or to understand whether they are representative of the views of the wider population of academics and community pharmacists. Following this, a qualitative study or mixed-methods approach could be used to test these themes within a larger set of primary healthcare professionals who could provide their input in evaluating the research needs of the population. Doing this sort of large scale study could be the step forward in influencing funding providers and policymakers to invest in future research studies for the wide-scale benefit of improved health outcomes and savings of money.

As with any study this is not without its limitations and these present as potential future research projects. Firstly, this is a qualitative piece of work which is aiming to explore and understand and the findings cannot be generalised at this point. In-order to be able to generalise, large quantitative studies would need to be undertaken and this sits nicely with a future research agenda. This study is also limited to five high income countries;

albeit with different health systems. To gain a wider international understanding pharmacy academics and practitioners in low and middle income countries could be included; along with a broader range of high income European nations.

CONCLUSION

This study set out to explore the views of pharmacy academics and practitioners about pharmacy practice and the research agenda moving forward into the future. The aim was to understand new methods which may be used in the future by pharmacy practice researchers; as perceived by practicing pharmacists and academics. Participants identified a wide range of issues within community pharmacy practice they would like to conduct research on. Academics largely focused on how research can be utilised in the community and how to implement findings to ensure sustainability of pharmacy practice research. A minority of academics would like to focus on how pharmacists use their clinical knowledge in the community setting, how they provide advice with over the counter treatments, and also how specific populations take their medications. Issues that community pharmacists would like to research are related to the current practice model such as allocating time to provide all the patient focused services on top of managing a business.

Some community pharmacists would like to see research into a practice model which does not involve making a profit out of delivering pharmacy services while others see a research agenda in the issues they see every day including the efficacy of extemporaneous compounds, the impact of pharmacist's advice on patient outcomes and issues related to chronic disease management and medication use.

REFERENCES

1.	An S, Muturi N. Subjective health literacy and older adults' assessment of direct-to-consumer prescription drug ads. J Health Commun. 2011;16 Suppl 3:242-55.
2.	Babar Z, Vitry A. Differences in Australian and New Zealand medicines funding policies. Australian Prescriber 2014(37):150-1.
3.	Weekes CV. African Americans and health literacy: a systematic review. Abnf J. 2012;23(4):76-80.
4.	Yang Y, Gourley DR, Gourley GA, Faris RJ, Womeodu RJ, Yang J, et al. African American patients' attitudes toward proactive health behaviors after exposure to direct-to-consumer advertising. J Natl Med Assoc. 2010;102(5):408-15.
5.	Centers for Disease Control and Prevention. Health Disparities Experienced by Racial/Ethnic Minority Populations 2004. Available from: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5333a1.htm
6.	Morris CJ, Cantrill JA, Weiss MC. GPs' attitudes to minor ailments. Family Practice. 2001;18(6):581-5.
7.	Bodenheimer T, Pham HH. Primary care: Current problems and proposed

solutions. . Health Affairs. 2010;29(5):799-805.
8.	Evans R, McGrail K, Morgan S, Barer M, Hertzman C. Apocalypse No : population aging and the future of health care systems. Social and Economic Dimensions of an Ageing Population. 2001;Research paper 59.
9.	Anonymous. Public Health and Aging: Trends in Aging—United States and Worldwide. JAMA. 2003;289(11):1371-3.
10.	Cornwall J, Davey JA. Impact of population ageing in New Zealand on the demand for health and disability support services and workforce implications New Zealand Institute for Research on Ageing (NZiRA) and the Health Services Research Centre (HSRC), Victoria University of Wellington 2004.
11.	Baqir W, Learoyd T, Sim A, Todd A. Cost analysis of a community pharmacy 'minor ailment scheme' across three primary care trusts in the North East of England. Journal of Public Health. 2011;33(4):551-5.
12.	Bojke C, Gravelle H, Hassell K, Whittington Z. Increasing patient choice in primary care: the management of minor ailments. Health Economics. 2004;13(1):73-86.
13.	Curley LE, Moody J, Gobarani R, Aspden T, Jensen M, McDonald M, et al. Is there potential for the future provision of triage services in community pharmacy? J. 2016;9:29.
14.	Wertheimer AI. New pharmacist roles and the physician shortage. Int J Pharm Pract. 2015;23(6):379-80.

15.   Gidman W, Cowley J. A qualitative exploration of opinions on the community pharmacists' role amongst the general public in Scotland. Int J Pharm Pract. 2013;21(5):288-96.

16.   Health Mo. Pharmacy Action Plan 2016 to 2020 2016 [09/08/2017]. Available from: http://www.health.govt.nz/publication/pharmacy-action-plan-2016-2020

17.   Bond C. The need for pharmacy practice research. Int J Pharm Pract. 2006(14):1-2.

18.   Jorgenson D, Lamb D, MacKinnon N. Practice Change Challenges and Priorities: A National Survey of Practising Pharmacists. Canadian Pharmacists Journal 2011;144(3):125 - 31.

19.   Eades CE, Ferguson JS, O'Carroll RE. Public health in community pharmacy: a systematic review of pharmacist and consumer views. BMC Public Health. 2011;11:582.

20.   Thomas M, Plimey J. The Future of Community Pharmacy in England - AT Kearney 2012. Available from: https://www.atkearney.com/documents/10192/649132/The+Future+of+Community+Pharmacy.pdf/1838dede-b95a-4989-8600-6b435bd00171

21.   George PP, Molina JA, Cheah J, Chan SC, Lim BP. The evolving role of the community pharmacist in chronic disease management - a literature review. Ann Acad Med Singapore. 2010;39(11):861-7.

22.   Smith J, Picton C, M. D. Now or Never: Shaping Pharmacy for the Future. The Report of the Commission on Future Models of Care Delivered Through Pharmacy. 2013. Available from: https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Publications/Now%20or%20Never%20-%20Report.pdf

23.   Iversen L, Mollison J, MacLeod TN. Attitudes of the general public to the expanding role of community pharmacists: a pilot study. Family Practice. 2001;18(5):534-6.

24.   Boote J, Telford R, Cooper C. Consumer involvement in health research: a review and research agenda. Health Policy. 2002;61(2):213-36.

25.   Latif A, Pollock K, Boardman HF. The contribution of the Medicines Use Review (MUR) consultation to counseling practice in community pharmacies. Patient education and counseling. 2011;83(3):336-44.

26.   Rosenthal M, Austin Z, Tsuyuki RT. "Are pharmacists the ultimate barrier to pharmacy practice change?.". Canadian Pharmacists Journal/Revue des Pharmaciens du Canada. 2010;143(1):37-42.

27.   Scahill S, Harrison J, Carswell P, Babar Z-U-D. Organisational culture: an important concept for pharmacy practice research. Pharm World Sci. 2009;31(5):517-21.

28.   Scahill SL. Placing "culture" at the center of social pharmacy practice and research. Res Soc Admn Pharm. 2013;9(1):1-3.

29.   Scahill SL, Carswell P, Harrison J. An organizational culture gap analysis in 6 New Zealand community pharmacies. Res Soc Admn Pharm. 2011;7(3):211-23.

30.   Scahill S, Harrison J, Sheridan J. The ABC of New Zealand's Ten Year Vision for Pharmacists: awareness, barriers and consultation. Int J Pharm Pract. 2009;17(3):135-42.

31.   Bidwell S, Thompson L. GPs, community pharmacists and shifting professional boundaries. N Z Med J. 2015;128(1414):19-26.

32.   Scahill S, Harrison J, Carswell P, Shaw J. Health care policy and community pharmacy: implications for the New Zealand primary health care sector. N Z Med J. 2010;123(1317):41-51.

33.	Kinsey H, Scahill S, Bye L, Harrison J. To explore pharmacists' views on the shift innew funding and service delivery model introduced through thein New Zealand's Community Pharmacy Services Agreement (CPSA) Int J Pharm Pract. 2016;Accepted (in press).

34.	Tsuyuki RT, Schindel TJ. "Changing pharmacy practice: the leadership challenge." Canadian Pharmacists Journal/Revue des Pharmaciens du Canada 2008;141(3):174-80.

35.	Zgarrick DP. Social psychology in an evolving profession: a research agenda for advancing clinical pharmacy services. Res Social Adm Pharm. 2014;10(5):701-3.

36.	Snyder ME, Zillich AJ, Primack BA, Rice KR, Somma McGivney MA, Pringle JL, et al. Exploring successful community pharmacist-physician collaborative working relationships using mixed methods. Res Social Adm Pharm. 2010;6(4):307-23.

37.	Almarsdottir AB, Kaae S, Traulsen JM. Opportunities and challenges in social pharmacy and pharmacy practice research. Res Social Adm Pharm. 2014;10(1):252-5.

38.	Armour C, Brillant M, Krass I. Pharmacists' views on involvement in pharmacy practice research: Strategies for facilitating participation. Pharm. 2007;5(2):59-66.

39.	Administration of the Fifth Community Pharmacy Agreement. 2014. Available from: http://www.anao.gov.au/Publications/Audit-Reports/2014

40.	Crespo-Gonzalez C, Garcia-Cardenas V, Benrimoj SI. The next phase in professional services research: From implementation to sustainability. Res Social Adm Pharm. 2017;13(5):896-901.

41.	Lau SR, Traulsen JM. Are we ready to accept the challenge? Addressing the shortcomings of contemporary qualitative health research. Res Social Adm Pharm. 2017;13(2):332-8.

42.	Raghupathi W, Raghupathi V. Big data analytics in healthcare: promise and potential. Health Inf Sci Syst. 2014;2:3.

43.	Hibberd R, Barber N, Cornford T, V. L. The evaluation of the electronic prescription service in primary care: interim report on the findings from the evaluation in early implementer sites 2012. Available from: http://eprints.lse.ac.uk/44890/1/EPS.pdf