

**What is Clinical Pharmacists experience of doing a PhD, including
applying for funding and NIHR Fellowships?**

A research project presented by

Nicole Abrokwah

for the degree of MPharm

Pharmacy Department

School of Life and Health Sciences

Aston University

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Supervised by Dr Ian Maidment

Abstract

Background

Evidence-based practice is a pillar of medicines optimisation and essential to modern healthcare. Pharmacists are more likely to incorporate evidence-based interventions in their practice if they are involved in research or have done a PhD. The main barriers to pharmacists participating in research are lack of protected income and lack of research experience. Fellowship programmes like the NIHR integrated clinical academic program provide Clinical Pharmacists with research experience and adequate funding to pursue a clinical academic career.

Objectives

To develop understandings of the experiences and challenges of clinical pharmacists in the UK that have done a PhD or studying for one, including those who have applied for NIHR fellowships and how research training influences their future career.

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Methods

A qualitative exploratory study. Fifteen semi-structured telephone interviews were used to explore the experiences of clinical pharmacists that had done or were doing a PhD. Thematic analysis was used to analyse the data manually. Findings were reported using the consolidated criteria for reporting qualitative research.

Inclusion Criteria

Participants were eligible if they were a qualified clinical pharmacist that had done a PhD or currently studying for one.

Results

Barriers and facilitators to obtaining funding:

The barriers were: a challenging NIHR application process due to a lack of research experience and an extensive application process. Facilitators were: Organisational and institutional support, Pharmacy research UK, NHS funding.

Key experience and challenges of doing a PhD:

The key theme was the juxtaposition of the unstructured, autonomous nature of PhD research with the structured nature of delivering clinical pharmacy services. This theme was either described in a positive light or as a challenge. Self-determination was a key theme, but co-regulation from supervisors and peers was necessary.

How the PhD and NIHR fellowships influenced the future career of the student:

Most participants expressed a desire for an integrated clinical academic role. An NIHR fellowship led to such a role for the successful applicant. Participants acknowledged the scarcity of suitable split roles in pharmacy and would choose academia over clinical practice. The PhD equipped participants with the skills to critically evaluate the primary literature in their fields. In addition to increased competence in conducting research, participants reported that they had improved in their teaching roles and acquired transferable skills.

Conclusion:

This project found that clinical pharmacists have a similar experience to other PhD candidates, but early career pharmacists whose highest academic credential was an MPharm degree found the lack of structure more challenging. NIHR awards are challenging to secure, but there are some institutional and organisational structures to support applicants. Due to the limited availability of clinical academic roles for pharmacists, sustaining the pipeline of research trained clinical pharmacists might become challenging as participants would choose a full-time academic career over clinical practice.

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2 Introduction

2.1 The need for research in healthcare organisations and professionals.

Research activity is essential to the practice of individual clinicians and the performance of healthcare organisations (Downing et al., 2017). A systematic review of the literature on the effect of research activity on healthcare organisations showed a positive correlation between research participation, and patient outcomes (Clarke and Loudon, 2011). It was found that there was a higher implementation of evidence-based medicine by clinicians and organisations that undertook research (Clarke and Loudon, 2011). While the consensus among pharmacists is that research is essential, they mostly carry out audits which do not contribute to improving clinical outcomes as much as clinical research (Lee et al., 2018). The Pharmacy profession does not prioritise research, leading to low student interest in pursuing careers in research and pharmacists not applying for research fellowships and postgraduate training (Parker et al., 2013). Due to the ageing population, 49% of people on medication are taking multiple drugs on a long-term basis (Gao et al., 2018) and 30-50% of these drugs are not used as intended (NICE, 2016, Gao et al., 2018). Hence, the need for pharmacists that are equipped to make evidence-based decisions.

2.2 Barriers and facilitators to pharmacist participation in research.

A systematic review found that the main barriers to pharmacist research participation were a lack of dedicated time, awareness of opportunities, research experience, competence, funding, training, mentorship and managerial support (Awaisu and Alsalmiy, 2015). The main facilitators to undertaking research were the belief in the importance of research, interest in the research topic, and believing the research has a benefit to patients. One study suggested that the facilitators are mostly related to the individual - intrinsic while the barriers are mostly organisational factors - extrinsic (Pager et al., 2012). Another study on UK pharmacists found that some extrinsic barriers were mostly narrated by pharmacists who did not participate in research which suggests that some of these extrinsic barriers like lack of time and managerial support were perceived rather than experienced (Lowrie et al., 2015).

2.3 Research culture in UK pharmacists

The NHS consultant pharmacist post has been created partly to strengthen the link between research and practice in Pharmacy; addressing the need for research capacity building and developing a workforce that is research aware (Department of Health, 2015). Consultant Pharmacists need to spend about a quarter of their time on research, by identifying gaps in the evidence base, developing suitable hypotheses to answer the questions, designing and evaluating research methodologies and contributing to clinical trials (Department of Health, 2015). There were only 70 consultant pharmacist posts in 2017 nationwide, and this is disproportionate to the requirement for clinical leadership from pharmacists in the NHS (Specialist Pharmacy Service, 2017). There are now 106 posts (RPS, 2020), but there is a need for about 600 posts nationwide (Specialist Pharmacy Service, 2017).

2.4 Building research capacity

“A research fellowship is a directed, highly individualised, postgraduate training program designed to prepare the participant to function as an independent investigator”(ACCP, 2009). Fellowships are one avenue to overcome some of the factors such as lack of protected time and funding that are known to be barriers to participation in research (Awaisu and Alsalmiy, 2015, Clough et al., 2017). The National Institute of Health Research (NIHR) is one organisation that provides research fellowships for clinicians. It is the largest funder of health and care research in the UK (NIHR, 2019). The NIHR academic clinical fellowship (ACF) was only available to doctors and dentists until the NIHR Integrated clinical academic programme (ICAP) was introduced in 2014 to provide a similar opportunity to other health care professionals including pharmacists

NHS England is legally required by the Department of Health and Social Care to promote research and Evidence-Based Practice within its Trusts and clinical commissioning groups (NHS England, 2017). The NHS partners with stakeholders, including the (NIHR) and Health Education England (HEE) to develop research opportunities, enhance the skills of clinical-researchers and strengthen career pathways (NHS England, 2017).The HEE-NIHR integrated clinical academic programme (ICAP) is a national research capacity building scheme that provides funding to healthcare professionals who wish to develop careers that integrate clinical

research and research leadership into their practice. The programme offers five different levels of awards, namely; internships, pre-doctoral clinical academic fellowship, clinical doctoral research fellowship, clinical and senior clinical lectureships, bridging schemes and mentorships (NIHR, 2019). Obtaining funding for this program is highly competitive (Clough et al., 2017). To build research capacity within pharmacy professionals, there needs to be an understanding of the experiences of pharmacists that have applied to these funders.

2.5 Aims

This research project aims to explore the experiences of Clinical Pharmacists in England who have a PhD, those who are currently studying for a PhD, NIHR fellows who are Clinical Pharmacists and to document the themes that narrate these experiences.

2.6 Objectives

- To understand the barriers and facilitators to obtain funding to study a PhD.
- To understand the students' experience of studying a PhD including the key challenges.
- To understand how postgraduate training and NIHR fellowships influence the future career of the student.

3 Methods

3.1 Design

An exploratory qualitative approach was adopted and reported against the consolidated criteria for reporting qualitative research (COREQ) guidelines to establish rigour and trustworthiness (Tong et al., 2007). A pilot interview was conducted on one of the participants to check the appropriateness of the interview guide included in appendix 1. No changes were made to the interview guide, and the pilot interview was included in the analysis. A Semi-structured interview was chosen as the data collection method to generate rich data relevant to the research question while providing flexibility to explore the unique perspective of individual participants (Barrett and Twycross, 2018). Telephone interviews were used to access a wider sample of participants and overcome geographical constraints.

3.2 Ethics and data storage

This project was approved by the Aston University Pharmacy Ethics Sub-Committee (PESC). The recordings were stored securely on the university home drive and deleted from the recording device.

3.3 Inclusion criteria

Participants were eligible if:

1. They were a qualified pharmacist.
2. They had done a clinical pharmacy research PhD or currently studying for one
3. They were employed by the NHS or were employed by the NHS before doing a full-time PhD

3.4 Sampling

A mixture of purposive and convenience sampling was used due to time constraints. Working with the project supervisor who has an extensive network of pharmacist-academics, Twitter was used to purposefully invite clinical pharmacists with a PhD or doing a PhD to participate in a 30-minute interview to explore their experiences. The first 15 eligible respondents with

the earliest availability were chosen due to time constraints. Pharmacists that had been awarded for NIHR fellowships were identified from a database (NIHR, 2019) and sent an email invitation to interview. It was anticipated that no new information would be gained after 12-15 interviews (Guest et al., 2006) and data saturation was reached by the fifteenth interview.

3.5 Recruitment

Participants were sent a participant information sheet attached in appendix 2 explaining the purpose of the project and a consent form by email, and interviews were scheduled. Participants were sent a reminder 30 minutes before the scheduled interview time. They were reminded of the purpose of the study at the beginning of the interview.

3.6 Data collection

Telephone interviews were conducted between 17/02/2020 and 11/03/2020, recorded using an Olympus digital recording device, anonymised and transcribed verbatim by the chief investigator using Microsoft Word. All transcripts were completely reviewed by the chief investigator for accuracy and to gain overall context. Interviews focused on exploring the participants PhD experiences, sources of funding and career aspirations. Transcription was done using a denaturalised approach, preserving the original features of participants speech (Davidson, 2009). The quotes included in the report were 'cleaned' to keep to the word count. Participants were sent a link to a Microsoft forms document collecting necessary demographic data and (n=14) 87.5% of participants completed the form.

3.7 Data Analysis

Thematic analysis is "a method for identifying, analysing and reporting patterns (themes) within data" (Clarke and Braun, 2017). A digital adaptation of this method described below was adopted.

1. All interviews were transcribed using Microsoft Word by the chief investigator thereby, facilitating initial familiarisation with the data corpus and potential themes were noted.

2. All transcripts were read and evaluated by the chief investigator, and provisional coding frames were noted.
3. The provisional codes generated at this stage were assigned to the relevant data extracts by using the comment feature on Microsoft Word.
4. Formal coding was done manually on a semantic level, identifying essential elements of the data that described the essence of a narrative.
5. Data extracts that described the same narrative were highlighted in the same colour, using a different colour to indicate each code (multiple codes were assigned to some data extracts).
6. Emphasis was placed on deviant narratives.
7. Data extracts in the same highlighter colour were collated and assigned a code.
8. All data extracts in the same colour were copied and pasted into a OneNote page to create a data set for that code. A data set refers to all instances within the data corpus where a specific code was referred to (Clarke and Braun, 2017).
9. A participant identifier was assigned to all data extracts for reference and to show that a range of participants was included in the results.
10. A page was assigned to all deviant narratives.
11. Themes were derived inductively, meaning that they were purely derived from the data without the influence of any existing knowledge of the subject.
12. The different codes were studied for similarities and grouped into provisional overarching themes.
13. The provisional themes were analysed to ensure that the data extracts and codes within each theme created a logical narrative and that individual themes were genuinely distinguishable.
14. The data was re-read critically, evaluating how it all fit into the defined themes and re-coding any data in the themes that were not initially coded.
15. A theme map was used to graphically illustrate the relationship between themes and subthemes, with the overarching theme being the central element and the codes mapping out of the theme.
16. Constant comparison was made, removing codes from themes and including new codes until there was a satisfactory connection between themes and codes and between the different themes.

17. The themes and subthemes were refined and given formal titles for analysis.

3.8 Reflexivity

In Qualitative research and thematic analysis, themes are constructed through interactions with research participants, the data generated, and the data analysis is influenced by the engagement of the researcher (Dodgson, 2019). Nicole Abrokwah is a female final year MPharm student at Aston University with a keen interest in undertaking a non-clinical pharmacy research masters in the future, going on to become a pre-registration pharmacist at a large multiple community pharmacy. The university has arranged all hospital pharmacy experience and a total of 48 hours compared to 1000 hrs in community pharmacy throughout the MPharm degree. This background may have facilitated a neutral interpretation of the views of the participants who were hospital pharmacists as the investigator has no immediate experience of either being a clinical pharmacist or a PhD student. A mobile note-taking app was used to capture views and interpretations throughout data collection.

4 Results

In analysing the interview data from fifteen participants which lasted an average of 26.5 minutes, six major themes and thirteen subthemes emerged to answer the three research questions. The sample included participants that were representative of twelve UK schools of pharmacy. One participant had been awarded an NIHR fellowship, and two participants had unsuccessfully applied for the NIHR doctoral training award. Five participants were still studying for their PhD while ten already had a PhD.

Participant code	age	ethnicity	gender	NHS band	Job category	Completed PhD? (YES/NO)
P1	31-40	White	male	8b	Pharmacist and lecturer	Y
P2	>50	White	female	8c	Clinical academic	Y
P3	31-40	Other	male	n/a	Lecturer	Y
P4	40-50	Asian	female	8b	Pharmacist	N
P5	31-40	White	female	n/a	Assistant Professor and Pharmacist	Y
P6	n/a	White	female	n/a	Lecturer	Y
P7	26-30	White	female	8a	NHS pharmacist	N
P8	>50	White	female	8c	Clinical Academic	Y
P9	>50	White	male	n/a	PhD student	N
P10	41-50	White	female	8a	Clinical academic	N
P11	41-50	White	male	8c	NHS pharmacist	Y
P12	31-40	White	female	7	Clinical academic	Y
P13	31-40	White	female	n/a	PhD student	N
P14	26-30	White	male	7	Pharmacist and Lecturer	Y
P15	41-50	mixed	Female	8b	Pharmacist	Y

Table 1 – characteristics of interview participants

Barriers and facilitators to obtaining funding	
Themes	Subthemes
Challenging NIHR application process	Long application process
	Insufficient research experience
	Protected income
Organisational and institutional support	Supporting grant applications
	NHS research funding
	Pharmacy Research UK

Table 2 Barriers and facilitators to obtaining funding

Experience of doing a PhD and key challenges	
Themes	Subthemes
Juxtaposition of PhD and clinical practice	Lack of structure
	Escape from monotony in clinical practice
	Isolation
Motivation	Self-determination and Co-regulation (extrinsic and intrinsic factors of motivation)

Table 3 Experience of doing a PhD and key challenges

How postgraduate training and NIHR fellowships influence the future career of the student	
Themes	Subthemes
Pragmatic Practice	Evidence-based practice
	Improved pedagogy
	Transferable skills
Future aspirations	Availability of suitable clinical academic posts
	Preference for academia over clinical practice

Table 4 How Postgraduate qualifications influence the student's future career

4.1 Barriers and facilitators to obtaining funding

The sources of funding for participants in this project were: NHS charitable funds, NHS department funds, Pharmacy research UK, commercial funders, PhD loan, The NIHR and university employers.

4.1.1 Challenging NIHR application process and protected income

The NIHR awardee was the only participant in this study whose financial requirements were exhaustively covered by one funder.

“I was really fortunate in that I did an NIHR funded fellowship, so I had my expenses, my salary was paid, my training costs were paid so I didn’t have any financial barriers to doing the PhD.”

P2

Other participants had partial funding from multiple sources, including **Pharmacy Research UK**, which was a running subtheme. Most participants had to take a pay cut to do the PhD.

“So, initially I was funded by the trust...then I was encouraged to apply for external funding so I applied to pharmacy research and was successfulthere was a major cut in my income and I guess that’s one of the aspects that prevented me from undertaking a PhD earlier.”

P10

“... I was really lucky to have a funded PhD, but the salary is quite low...so that can be quite difficult... I was encouraged to apply for small research grants during my PhD to supplement my research costs and salary so, that was quite helpful... So, that was from pharmacy research UK.”

P14

Participants were aware of the NIHR schemes and the consensus among participants was that NIHR fellowships are attractive opportunities compared to other sources of funding.

“At the moment I’m looking to apply for the NIHR ICAF to provide me with the opportunity to go back and do more clinical practice and continue with my research.”

P12

4.1.1.1 Long application process

The process of securing an NIHR award was described as extremely challenging and seemingly impossible by all relevant participants. There was a consistent reaction of nervous laughter, suggesting a recollection of distress and apprehension compared to when talking about other funders. This theme was consistent amongst all participants regardless of career stage.

“...it was quite a torturous process.... the application itself probably took me about five months in total... working solidly outside working hours, so evenings and weekends... it certainly shouldn’t be taken lightly in terms of deciding whether or not to apply...”

P2

“...so, I got two young pharmacists this year applying for the pre-doctoral fellowship...the NIHR one and you know chances are they won’t get it...”

P8

Unsuccessful participants said they received detailed feedback which likely facilitated the success of future applications to other funders.

“...Because I could reflect on the feedback that I received from NIHR, I was able to improve my research project and also improve the application for the next grant application.”

P10

4.1.1.2 Lack of research experience

Having a track record of independently conducting research is a facilitator to securing funding. This participant was aware of the NIHR programmes but did not apply due to insufficient research experience.

“I was aware that the NIHR have doctoral fellowships, but they’re very competitive, and you have to be somebody who is quite a senior clinician already and got some research under their belt, so I didn’t think I was going to be a particularly strong candidate for one of those applications...”

P14

In comparison, this participant received full funding from her NHS Trust on her first application and did not need to consider other funding sources.

“I’ve also been the principal investigator for several studies within the Trust, and that’s a really good way to get hand-on experience of doing research.”

P4

4.1.2 Organisational and institutional support

Support from the employing organisation or evidence of an employing organisation with resources in place to support the research is a facilitator to obtaining funding for research. This support includes supervisor support.

“...I needed to be affiliated with a hospital and fortunately.... I had a clinical supervisor at the xxx hospital, so xxx hospital gave me an honorary contract for the duration of my PhD... it felt like doing the PhD was reliant on my academic supervisor who had those networks...”

P3

4.1.2.1 Supporting grant applications

The process of writing grant applications is challenging. Some participants had access to professional resources that reviewed their application and prepared them for the interview process.

“Completing the grant application was new, and you needed to find out loads of information on how to do it, how to complete sections... where to find the people to professionally help you so grant writing was definitely challenging...”

P15

“...I went into the university with my line manager and said I’m gonna apply for this grant...they did a mock interview and gave me feedback...that was a game changer for me.”

P3

The results from this project show that The Royal Pharmaceutical Society (RPS) provides such support to pharmacist researchers.

“Pharmacy research UK was slightly easier maybe because I had done the NIHR application... it was for less money, so it was slightly easier to prepare the application and I got support from the RPS, they reviewed my research application and gave me some feedback.”

P10

There might be a lack of awareness of the availability of these resources to potential pharmacist researchers. On the other hand, only the more proactive individuals might make an effort to access the support available to them.

“...if you ask research development in your hospital...you just don’t ask...all the barriers as pharmacists are just in our head...I know of a pharmacist that applied for research funding many times, and I said to her - the hospital she was at had a biomedical research centre I said why haven’t you engaged with the BRC? And she was like “I didn’t think I could...”

P8

4.1.2.2 NHS funding

The NHS funded most participants in this project either through funds held by the department, supervisor or through NHS charitable funds.

“So, I started my PhD not long after I qualified as a pharmacist and my PhD is quite a unique PhD in that it was exclusively funded by an NHS hospital.”

P14

In addition to financial support from the department, this participant received moral support from his manager.

“...It was straightforward for me to be funded for this programme because my department had paid for it... I’ve always wanted to do a doctorate and when the opportunity came along to have it funded by my department and the enthusiasm of my line manager at the time...”

P11

4.2 Experience of doing a PhD and key challenges

4.2.1 The juxtaposition of the PhD experience with clinical practice

Majority of participants in this study expressed the challenges of doing a PhD in comparison with being a clinical pharmacist.

4.2.1.1 Lack of structure during PhD

Participants cited the transition from working in a hospital ward to becoming a PhD researcher as a key challenge.

“...going from working in a hospital where you’ve got targets, you’ve got med recs to do, you’ve got TTOs to do, and you’re counselling to a PhD where there’s no rules really, your day is not structured and often you’ve got to really self-motivate yourself.”

P14

“...because in clinical practice, everyone tends to work the same way with the same outcomes...targets like medicines reconciliation or prepping discharge that’s a set goal that you’re working towards each day on the ward there’s none of that within PhD life... you’re very much responsible for driving it so I found that a bit of a challenge.”

P7

Some participants did not refer to the lack of structure as a challenge, and they had all done a research masters before the PhD

“...I’ve done research right through the very start of my career in such a small way. Did a masters of education and did a research project as part of that...”

P2

“... Got first research experience during MSc degree which was straight after my diploma, published subsequently after my master’s degree...”

P11

One participant speculated that other PhD candidates were better prepared to deal with the lack of structure because they had done a research masters.

“...also learning how to do research as I hadn’t got any formal training and I felt that people I knew (not pharmacists) but other people who were doing a

PhD, I could see that those who were doing an MRes were better prepared in terms of research knowledge than I was...

P6

4.2.1.2 Monotony in clinical practice

Other participants considered the lack of structure described previously as a welcome challenge because it gave them a break from clinical practice.

“...I could see myself stagnating at the hospital and I was getting a bit bored and I wanted to do something a bit different really...”

P13

...it's a really positive experience ...when you're a pharmacist, you're often helping others make decisions ... but my PhD I'm the expert and I really love that...”

Pt 9

Other participants had a narrative that indicated a subliminal sense of boredom and lack of intellectual stimulation including P1 who implicitly described this monotony at three different points during the interview.

“My inclination to undertake a PhD has always been somewhere in the background... but never was really something I felt was particularly important until probably a bit later on when I'd done two post graduate diplomas and thought okay, I want a new challenge.”

P4

“...Newly qualified clinical pharmacist came to xxx hospital which they thought was the best of the best and they got so depressed mostly at first, very bright kid just got so disillusioned doing TTOs discharge discharge discharge and not really being given the opportunity or being taught how to engage in a sort of better practice or an academic practice.”

P8

4.2.1.3 Isolation during PhD

Isolation was a challenge reported by the participants and found to be a major theme both in terms of the frequency in the data corpus and the intensity with which some participants described it.

“sometimes life was put on pause and you do feel slightly isolated when things aren’t going well with your project, but you just have to keep motivating yourself to do it.”

P3

“But the challenge was the isolation that comes with that so you’re often working on your own and having to work through problems on your own”

P12

4.2.2 Motivation, self-determination and co-regulation

There were various sources of motivation to study a PhD found in this project. These sources will be classed as being intrinsic or extrinsic to the individual.

Most participants reported a passion for research which is an intrinsic motivator.

“... I think it just comes down to my passion being the primary driver...”

P7

On further exploration, it was discovered that there were other motivators.

“...it comes down to where you see yourself in your career... I saw a PhD as an option...to open up more doors for me...laughs... I also see the future of pharmacists like consultant pharmacists being pharmacists that have really strong research backgrounds...”

P7

Most participants claimed to be resilient, driven etc.

“...I’m quite driven... I think I don’t struggle as much with those challenges that I’ve mentioned ...if you weren’t, I can imagine the PhD becoming a tiresome three years.”

P6

“... I have got a lot of stamina to stick things out through thick and thin and I am what they call a complete finisher.”

P4

One participant would not describe himself as being driven but was sufficiently motivated by extrinsic factors.

“...I think the thing that got me through my PhD was that I wanted to progress in my career... I didn’t want to remain a hospital pharmacist forever...”

P1

In addition to being driven and self-determined, there was a need for external support from peers and supervisors.

“...if you’re working with a team of other PhD students that support network helps...a lot of PhD life is very solitary; you get engrossed in your question...”

P15

“My main supervisor is fantastic; he’s so calming even when things are going very wrong and that has an impact on you.... he’s very supportive of what I’ve achieved and keeps pushing to see how far I can take it...”

Pt 11

4.3 How post-graduate training and NIHR fellowships influence the future career of the student

These themes and subthemes describe the reflections of the participants on how their practice changed following a PhD.

4.3.1 Pragmatic practice

All but one participant reported that they were more competent at various aspects of their jobs in addition to being more competent in conducting research.

4.3.1.1 Evidence-based practice

Participants were equipped to critically evaluate the literature in their specialisations and make evidence-based decisions in their practice.

"I think I understand the research... I can apply all of the research that's been done in respiratory medicine to patients better...."

P5

"...but when you engage in an academic process and you're in clinical practice you realise...that it makes you a better pharmacist as far as the patients are concerned... to write a paper one had to review the literature, so I knew the evidence, I could critically appraise it..."

P8

They were more comfortable with deviating from guidelines when appropriate and evaluating the primary literature when making decisions.

"I'm used to dealing with uncertainties... I'm probably able to practice more at a specialist level because of my research background...what I mean with the flexibility is confidence to deviate from guidelines when not appropriate for that patient."

P14

In addition to being "a lot braver", P1 was better at liaising with other members of the multidisciplinary team. Instead of relying entirely on guidelines, he was equipped to understand the limitations of the guidelines. This understanding effectively made him a better team member because he could work with other clinicians to make the best decision for a specific patient rather than making binary or algorithmic decisions.

“...when it comes to patient care I’m a lot braver..... say someone comes in with an acute kidney injury...we need to take them off metformin, lisinopril etc but someone on the team says keep them on metformin, I can be like let’s talk about why you want to do that.”

P1

4.3.1.2 Improved pedagogy

Participants that had teaching roles at the university or in a hospital reported that they became better educators than they were.

“I certainly look at things very differently now...and trying to innovate much more in my academic role.”

P14

“I’m starting to really proactively support students that are shadowing me...”

P7

4.3.1.3 Transferable skills

This project found that a PhD confers skills that are not directly related to clinical practice or conducting research; Skills like collaboration, leadership, effective communication.

“...my professional life has definitely grown especially in things like leadership and management... which you don’t tend to get any training...I have more confidence in leading the team, managing projects.”

P10

“... I’m more confident and I can speak to anyone now...I can go on a ward round and talk to the consultants, registrar, specialist nurses, physiotherapists... more confident to be part of the MDT...”

P1

4.3.2 Future aspirations

Majority of the participants in this study expressed a desire to have a mixed career in the future depending on the availability of a suitable position.

"I'd quite like to be a professor...I think I'd still like to have my clinical practice as well...somewhere along the line if you become a professor you have to give something up."

P1

"I see myself having a split role initially after the PhD, working between academia and clinical practice... I really love spending time with patients and getting involved with the MDT...but I definitely don't see myself doing it 100% of the time..."

P7

Some participants acknowledged that finding a suitable split position might be challenging.

"...I'm not sure I would be able to find a clinical job which has a research aspect to it...but that would be my career aspiration..."

P10

Doing the NIHR doctoral fellowship led to a suitable split role for P2.

"...I really just anticipate incorporating research in my day job role...using the skills that I acquired during the PhD...seeing it as part of my role rather than separate thing that I do..."

P2

A minority of participants wished to become full-time researchers.

"I know for certain that I won't go back to being a clinical pharmacist, I'd like to do some postdoc research ideally."

P9

“I think my skill sets suit academia better and I would like to stay in an academic environment... the traditional pathway would be to do a postdoc.”

P13

5 Discussion

This project found results that are similar to findings from other studies and the experience of clinical pharmacists doing a PhD is similar to the broader population of doctoral students. Findings suggest that the clinical pharmacist job role made the unstructured nature of PhD research particularly challenging for some participants. The most recent review of the literature on the experiences of doctoral students or PhD students found that the factors that affect a student's completion and contribute to their PhD experience can be classified as being intrinsic or extrinsic. Extrinsic factors include supervisor support, personal/social lives and the department. On the other hand, inner processes (mental or psychological processes) that are immediately related to academic work such as motivation, writing skills, self-regulatory strategies and academic identity were classed as internal factors (Sverdlik et al., 2018).

5.1 Challenging NIHR application process and organisational support

Access to sufficient funding is an extrinsic factor shown to influence the experience and well-being of PhD candidates (Sverdlik et al., 2018). The findings from this project resonate with findings from the literature that lack of protected income is a barrier to pharmacists carrying out research or pursuing clinical academic careers (Awaisu and Alsalimy, 2015). The NIHR was the only funder where the participant did not have to take a pay cut to do a PhD. It is unlikely that higher-earning pharmacists would be able or willing to pursue a research career if their income was not protected. NIHR guidance suggests that applicants should dedicate between six to twelve months to write a competitive application (NIHR, 2020) which might be an impossible time commitment for most full-time pharmacists trying to balance work with other commitments.

The difficult NIHR funding journey is not peculiar to this project. In a survey of 231 non-medical health professionals including pharmacists that applied for research funding including NIHR fellowship schemes, there were several challenges associated with the funding application process, including the extensive and difficult application process, lack of feedback from failed applications, problems finding the right supervisors, support from the host organisations for the application process and a lack of funding opportunities (Richardson et al., 2019). In this project, the only common challenge was the extensive and difficult funding process, but the other challenges like organisational and institutional support were conversely described as facilitators. This contradiction is likely due to the sample size and small number of organisations represented in this study.

Due to the prestigious nature of NIHR awards, the selection process is designed to identify the most capable applicants. Unlike professions like medicine where research is embedded with career progression, a lack of research culture and low research participation among pharmacists compared to other professions might be a hindrance to pharmacist applicants because NIHR guidance suggests that for a competitive application, applicants should be able to demonstrate a history of independently conducting research (NIHR, 2020).

A systematic review on pharmacist participation in research found that lack of time and managerial support are external barriers that hinder participation in research (Awaisu and Alsalimy, 2015). Although hospital pharmacists were included in the systematic review, most of the studies were done on community pharmacists (Awaisu and Alsalimy, 2015). Organisational barriers such as lack of protected time and managerial support were not found in this project. Conversely, there was a theme of adequate managerial support. This echoes findings from a study on NHS pharmacists that these barriers are perceived rather than experienced (Lowrie et al., 2015).

5.2 The Juxtaposition of the PhD experience with clinical practice

A literature review on the experiences of doctoral candidates revealed the lack of structure as one of the most frequently reported challenges (Sverdlik et al., 2018). This theme is not unique to this project, but its prevalence in the context of comparison with clinical practice suggests that

the clinical pharmacist job experience makes this lack of structure more challenging for early-career clinical pharmacists or those whose highest academic credential before the PhD was the MPharm. Participants who had done a research masters did not consider the unstructured nature of PhD research a challenge; these participants were band 8b-8c pharmacists which suggests that career stage could be a confounding factor. It has been suggested that the MSc in clinical pharmacy does not increase competence and research confidence in hospital pharmacists (Lowrie et al., 2015) but the findings from this project suggest that a research masters could potentially ease the transition into a PhD programme.

The MPharm is neither designed nor intended to prepare graduates for planning and conducting research - "The programme integrates science and practice and equips students with the theoretical knowledge, professional behaviours and clinical skills required to become a pharmacist." (GPhC, 2020). PhD research involves a great deal of self-direction compared to the standard undergraduate MPharm qualification possessed by most participants. NHS band 8b-8c pharmacists have to lead teams and manage others which potentially prepared the participants for the self-directed, autonomous and unstructured nature of PhD research.

5.3 Self-Determination and motivation

The self-determination theory of human motivation proposes that humans have three innate psychological needs; competence, autonomy and relatedness and that when these needs are met, optimal function, wellbeing and growth can be achieved (Deci and Ryan, 2008). This theory assumes that humans are naturally inclined to seek growth, and that intrinsic factors of motivation are more important than extrinsic factors to reach goals. Activities are defined as being intrinsically motivated if the individual engages in them purely out of interest and extrinsically motivated if the individual participates in them to obtain a reward that is separate from participating in that activity or in order to avoid negative consequences. In the context of this project, a participant is said to be intrinsically motivated if their main reason for doing a PhD was a passion for research and extrinsically motivated if their reason for doing a PhD was for reasons such as career progression, being invited to do a PhD by a senior academic, to boost their ego or sense of identity within the multidisciplinary team.

Intrinsic and extrinsic motivation can sometimes exist as separate entities that are completely internally or externally regulated but mostly not diametrically opposed (Deci and Ryan, 2000). There are extrinsic factors that can either enable or hinder the natural inclination to grow hence, the different types of motivation exist on a spectrum where external motivation is either completely regulated by external factors on one end, by external factors that have been internalised in the middle. Internal motivation being completely internally regulated on the opposite end. In this study, although the majority of participants reported an intrinsic motivator like a passion for research as found in a different study (Lowrie et al., 2015) as their primary motivation for doing a PhD, upon further exploration and analysis it became apparent that they were also motivated by extrinsic factors like career progression or having family members in academia. These extrinsic factors had been internalised to varying degrees, highlighting a continuum of regulatory styles. Due to social desirability bias, only P1, P3 and P15 reported extrinsic factors as their main reason for doing the PhD. The data analysis confirms that motivation exists on a continuum. Contrary to the theory that intrinsic motivation is more important in achieving goals, participants in this project were sufficiently motivated by extrinsic factors. P2, who successfully applied for NIHR funding was a deviant case in terms of motivation to do a PhD as her primary motivation was to answer a research question that became obvious during clinical practice. Although P2 was a deviant case in this project, her primary motivation is in line with findings from studies on other NIHR awardees where 30% of health professionals did a PhD to “investigate a particular research question relating to clinical care provision” (Richardson et al., 2019.)

5.3.1 Co-Regulation and isolation

“Co-regulation of learning refers to a social regulation of learning in which learners temporarily regulate their cognition, behaviour, motivation and emotions together with other students or a teacher” (Raisanen et al., 2016). Self-direction is a crucial element in PhD and Doctoral studies across all disciplines (Lynch et al., 2018). Although participants in this project reported that they were sufficiently self-directed, the themes of isolation and supervisor support suggest that co-regulation was essential to their PhD experience. This finding echoes the findings from other studies where it has been found that social support might strengthen a student’s sense of professional identity as a researcher and their place in the research community (Mantai, 2019, Lowrie et al., 2015) and that support from the

supervisory team is a key element of successful doctoral studies (Devos et al., 2015). These results are not unique to clinical pharmacists as they are in line with the findings from a study on medical students that co-regulation from supervisors and peers contributes to self-regulated learning in medical students (Bransen et al., 2020). Some participants worked in NHS Trusts that organised meetings for doctoral and post-doctoral researchers and used this to fulfil their need for relatedness and peer support. On the academic side, some participants were part of PhD groups at their university.

5.4 Pragmatic Clinical Practice and Critical appraisal skills

Studies have shown that health care professionals and organisations that are research active are more likely to incorporate EBM thereby leading to better patient outcomes compared to NHS Trusts with less research activity (Harding et al., 2017, Cooper et al., 2019). A cross-sectional survey on the use of evidence-based medicine in health care professionals in France found that only 12% of pharmacist respondents reported using evidence-based medicine compared to 22% of nurses and 36% of doctors (Lafuente-Lafuente et al., 2019). The survey found that lack of critical appraisal skills was one of the most frequently reported reasons for not practising evidence-based medicine and “the profession was the only variable significantly associated with the declared degree of knowledge and use of EBM” (Lafuente-Lafuente et al., 2019). The participants in this student project corroborated this finding as they claimed to be able to critically appraise the primary literature, whereas they did not possess this skill before doing a PhD.

Medicines are the most common intervention in the NHS (Royal Pharmaceutical Society, 2013). On the other hand, a study in two NHS hospitals found that 11.5% of hospital admissions were as a result of the adverse effects of medicines, half of which could have been prevented (Kongkaew et al., 2013). Pharmacists are trained to be experts in medicines, therefore, play an integral role in medicines optimisation ultimately leading to better patient outcomes and improving population health. The Pharmacy Integration fund set up in 2016 has contributed to the inclusion of pharmacists in novel care settings, e.g. general practice, care homes and integrated urgent care hubs (NHS England, 2018). Lord Carter’s report of 2016 proposed that hospital pharmacies increase the number of prescribing pharmacists and deploy more clinical pharmacists

both independently and as part of the multidisciplinary team to optimise medicine use (Lord Carter of Coles, 2016). This proposal highlights the need for pharmacists that are equipped to make evidence-based decisions to improve patient outcomes and also contribute to efficient use of NHS resources.

5.5 Improved Pedagogy and Transferable skills.

The findings from this project show that doing a PhD and engagement with the academic process made participants better educators, although self-reported. This finding is in line with findings from other research that shows that pharmacy researchers have the potential to improve the education of pharmacy students (Kehrer and Svensson, 2012). In addition to the more obvious outcomes such as evidence-based clinical practice and increased competence in conducting research, doing a PhD conferred transferrable skills to participants. This finding echoes the findings from a study on doctoral candidates that doing a PhD confers skills that are transferable to different settings such as teamwork, organisation, management and the candidate can apply their specialist knowledge to broader concepts (Gokhberg et al., 2017).

5.6 Future aspirations

The post-doctoral intentions of clinicians doing a PhD are of interest as it could provide a surrogate measure of the future clinical academic workforce to teach the future generations of clinicians and a measure of research trained clinicians (Lopes et al., 2017). Research trained clinical pharmacists are in a unique position to develop hypotheses to investigate problems that would otherwise be imperceptible to other clinicians (Hall et al., 2017). Although participants in this study expressed the desire for a split job where they could maintain their clinical practice, they preferred to be full-time academics in the absence of a suitable split role. A definitive statement cannot be made regarding this due to social desirability bias. This objective could be further explored by using anonymous questionnaires to collect data. Furthermore, findings from this study suggest that there are not enough split clinical academic roles that compensate pharmacists at the appropriate pay grade. This finding is in line with another study which found that “there is no model clinical academic contract or guidance on pay and conditions” for health care professionals other than medics (Richardson et al., 2019).

5.7 Strengths and Limitations

The strengths of this study are as follows: due to the highly educated nature of the group being investigated, most participants in the project were able to articulate their experiences succinctly during the interview, more participants had already completed their PhD than participants currently studying for one thereby allowing for narratives of the complete experience with the benefit of hindsight.

Like all research, this project has some limitations. Participants in this project represented only twelve UK universities, so the results are not generalisable; 86.7% of participants were white compared to 46% of registered UK pharmacists (GPhC, 2019). There was no database to identify pharmacists that had unsuccessfully applied for NIHR funding and only one successful NIHR applicant responded to the interview invitation therefore not enough data was collected to meet the research objective of exploring the experiences of NIHR awardees. As the interviewer had previously made contact with participants via Twitter, there might have been an element of social desirability bias.

5.8 Implications for pharmacists and policymakers

There is potential for NHS pharmacists to contribute to research output excluding audits. Academic Pharmacy departments and employers should be aware of the challenges that pharmacists face in relation to PhD study. This awareness could inform the development of resources and structures to support the PhD students, possibly encouraging more clinical pharmacists to pursue a postgraduate degree, ultimately increasing the clinical academic pharmacist pipeline and enhancing the profession.

5.9 Future research

Further research should attempt to diversify participants and include more pharmacists that have applied for NIHR funding either successfully or unsuccessfully. Furthermore, an attempt should be made to reduce social desirability bias by using questionnaires or free text surveys to collect data regarding career aspirations anonymously. Ultimately, this research could inform the implementation of clinical academic roles specifically for Pharmacists.

6 Conclusion

Practising evidence-based medicine is crucial to running an efficient national health service. It endows economic benefits by using scarce resources efficiently, better outcomes to individual patients and improves population health. The integration of pharmacists into various levels of the health service and novel roles means that they are ideally placed to contribute their expertise to achieve optimal outcomes. It is widely touted that evidence-based medicine is a pillar of medicines optimisation, rightly leading to the assumption that pharmacists are trained to practise evidence-based medicine. The results from this project show that practising EBM is an advanced competency which is developed by research engagement and that the standard MPharm degree does not adequately equip clinical pharmacists with the skills required to incorporate this skill that is fundamental to their practice.

Although there are funding sources exclusively available to pharmacist researchers and relatively easily accessible, the participants in this project have narrated that these funders do not eliminate the financial barrier to pursuing a research career. The NIHR is one funder that comprehensively eliminates the financial barriers to research participation. The main barrier to accessing NIHR funding is a lack of research experience, and due to traditional pharmacist job roles, pharmacists that are interested in a research career have to pro-actively seek opportunities to engage in research and develop their research portfolio to apply for these prestigious fellowships competitively.

The findings of this project show that upon completing a PhD, most pharmacists will have to choose between academia and clinical practice. Taking into account the subtheme of monotony in clinical practice, most participants would likely choose a full-time academic career over a clinical career in the absence of a suitable split role. This outcome would not be ideal as there is a need to develop and retain a clinical academic workforce in pharmacy so that research can be translated into practice and vice versa.

7 COREQ Checklist

Topic	Item number	Guide question	Reported on page no
Domain I: Research team and reflexivity			
Personal Characteristics.			
Interviewer	1	Which Author Conducted the interview?	11
Credentials	2	What were the researcher's credentials?	11
Occupation	3	What was their occupation at the time of the study?	11
Gender	4	Was the researcher male or female?	11
Experience and training	5	What experience or training did the researcher have?	11
Relationship with Participants			
Relationship established	6	Was a relationship established prior to study commencement?	8
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	41
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	11

DOMAIN 2: Study design			
Theoretical framework			
Methodological Orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	9
Topic	Item number	Guide question	Reported On Page No.
Participant Selection			
Sampling	10	How were Participants selected?	8
Method of approach	11	How were Participants approached?	8
Sample size	12	How many participants were in the study	6
Non-participation	13	How many people refused to participate or dropped out? Reasons?	n/a
Setting			
Setting of data collection	14	Where was the data collected?	9
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	n/a
Description of sample	16	What are the important characteristics of the sample e.g. demographics data, date etc?	12
Data collection			

Topic	Item number	Guide question	Reported On Page No.
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	8
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	No
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	9
Field notes	20	Were field notes made during and/or after the interview?	9,11
Duration	21	What was the duration of the interviews?	9,11
Data Saturation	22	Was data saturation described?	9
Transcripts returned	23	Were transcripts returned to the participants for comments and/or correction	No
Domain 3: Analysis and Findings			
Number of data coders	24	How many data coders coded the data?	10
Description of the coding tree	25	Did Authors provide a description of the coding tree?	n/a
Derivation of themes	26	Were themes identified in advance or derived from the data?	10
Software	27	What software if applicable, was used to manage the data?	n/a

Participant Checking	28	Did participants provide feedback on the findings?	n/a
Reporting			
Topic	Item number	Guide question	Reported On Page No.
Quotations Presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	14-25
Data and Findings Consistent	30	Was there consistency between the data presented and the findings?	14-25
Clarity of major themes	31	Were major themes clearly presented in the findings?	13-14
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	29, 26-31

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Appendix 1

What is clinical pharmacists experience of studying a PhD including NIHR fellowships and what does it lead to?

Thank you for taking part in this interview, I really do appreciate the time you have given. Before we begin, I want to make it clear that if you wish to skip any question(s) during the interview, or if you want to stop the interview, all you have to do is say; you do not need to give any explanation for doing so.

Are you happy to begin the interview?

1. What is your current job?
 - i. Which area of clinical pharmacy do you work in?
 - ii. At what stage in your career did you become interested in research?
2. Tell me about your research
 - i. How/when did you get your first research experience
 - ii. What experience of research did you have prior to PhD – ICAP, mentors, publication, service evaluation, clinical audit etc
3. Can you tell me about your PhD experience?
 - i. What key challenges have you experienced so far/ did you experience?
 - ii. Are there any personal attributes/institutional features that helped you overcome these challenges?
 - iii. What benefit have you derived from PhD study?
4. What motivates you to undertake a PhD/professional doctorate?
 - i. Can you talk about primary and secondary motivations?
 - ii. Passion for research vs increasing employability.
5. How was your PhD funded? / how is your PhD being funded?
 - i. Did you apply for or consider applying for any research fellowships such as NIHR?
 - ii. If yes – why, if no – why not?
 - iii. Was it challenging to secure funding?

6. Future Career

- i. What are your career aspirations?
- ii. Do you use your research skills at your job?
- iii. Moving forward, how do you expect your practice will be affected by the PhD/
how has your practice been affected.

Thank you for your time.

Appendix 2

**Participant Information Sheet****Project Title: What is Clinical Pharmacist's Experience of doing a PhD****Chief Investigator: Nicole Abrokwa****Supervisor: Dr Ian Maidment****Invitation**

You are being invited to take part in an Aston University undergraduate MPharm research project. The research is designed to explore the experiences of clinical pharmacists that have done or are doing a PhD and/or National Institute of Health Research (NIHR) fellowships. The project is approved by Aston University.

Before you decide if you wish to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. If you have any questions or require any further information, please ask a member of the research team: Contact Information can be found at the end of this sheet.

Purpose of the Study

- To understand the barriers and facilitators to obtaining funding to study a PhD
- To understand the students' experience of studying a PhD including the key challenges
- To understand how postgraduate training and NIHR fellowships influence the future career of the student.

What do I have to do?

- Fill pro-forma with demographic information
- Participate in a telephone interview that will last no longer than 30 minutes at a time that will be pre-communicated to you.

Interview

The interview will use a semi-structured format. The purpose of the interview is to explore your experiences of studying for a PhD and applying for funding.

Will my taking part in this project be kept confidential?

Data from the interview will be anonymised and cannot be traced back to you.

What will happen to the results of the research project?

This is an undergraduate MPharm research project that might be published and/or presented at an academic conference. If interested, you can obtain a copy of the report by contacting the researcher using contact details at the bottom of this page. If any information provided by you is included in the report, it will be completely anonymised and cannot be traced back to you.

Risks

We do not anticipate any risks, however there is the potential that the discussion might cause some distress. If this occurs, the student will contact the supervisor for advice.

Who is organising and funding the research?


This research is not funded by any individuals or organisations. It is organised by Nicole Abrokwhah, a final year MPharm student and supervised by Dr Ian Maidment, a clinical pharmacist and senior lecturer at Aston University.

Thank you for taking the time to consider taking part in this study

Contact for further information

Chief investigator: Nicole Abrokwhah email at abrokwan@aston.ac.uk or phone 07471504898

Appendix 3



Consent Form: What is Clinical Pharmacists experience of applying and studying for a PhD

Chief Investigator: Nicole Abrokwah

Please initial the boxes if you agree. One signed copy of the form is for you to keep and the other will be kept by the researcher.

1. → I confirm that I have read and understand the Participant Information Sheet Ver 1, 18/12/19. ☐ ☐
2. → I have had the opportunity to ask questions and have them answered. ☐ ☐
3. → I agree to the interview being audio recorded. ☐ ☐
4. → I understand that all information provided will be kept **Vertical (Category) Axis** main confidential and that all efforts will be made to keep it confidential (except as might be required by law). ☐ ☐
5. → I agree that data gathered in this study may be stored anonymously and securely. ☐ ☐
6. → Personal details and any information that can be used to identify me will not appear in any publication and I agree that anonymised extracts from the recording can be used in the report. ☐ ☐
7. → I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason. ☐ ☐

Participants Signature Name Date

Ver 1, 18/12/19

Investigator's Signature Name Date