General Practice-based Pharmacy Longitudinal Clerkship: a Theoretically Underpinned Qualitative Evaluation

Catriona Innes

NHS Highland

Scott Cunningham

Robert Gordon University School of Pharmacy and Life Sciences

Brian Addison

Robert Gordon University School of Pharmacy and Life Sciences

Yvonne Wedekind

University of Dundee School of Medicine

Emma Watson

NHS Highland

Ian Rudd

NHS Highland

Ailsa Power

NHS Education for Scotland

Laura Karim

Robert Gordon University

Gordon F Rushworth (✉ gordon.rushworth@nhs.scot)

NHS Highland <https://orcid.org/0000-0001-6085-6044>

Research Article

Keywords: clinical clerkship, pharmacy, general practice, experiential learning

Posted Date: January 27th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1283929/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

BACKGROUND: Undergraduate medical student Longitudinal Integrated Clerkships improve clinical exposure. A Pharmacy Longitudinal Clerkship (PLC) was developed as a means of developing student pharmacists' (SPs) knowledge, skills and behaviours in general practice.

AIM: The aim of this research was to carry out a theoretically underpinned qualitative evaluation of a PLC.

METHOD: General practice-based PLCs were delivered in 2019/20 and 2020/21 for two cohorts of SPs in NHS Highland Health Board, Scotland. Qualitative semi-structured interviews were used to explore experiences with all key stakeholders. Informed written consent was obtained. An interview schedule was developed and piloted using the Theoretical Domains Framework (TDF). Interviews were audio-recorded, transcribed verbatim and analysed using thematic methodology. Ethics approval was granted.

RESULTS: Interviews were completed with seven SPs and five general practitioner (GP) clinical tutors. Themes were identified that mapped to TDF domains and included; utilisation and practical application of knowledge; triangulation of skills under clinical supervision; confidence building with clinical and patient contact; elucidation of professional roles within general practice.

CONCLUSION: This evaluation shows benefits of embedding SPs within clinical teams and immersing them in a clinical environment over a prolonged period of time as part of a Pharmacy Longitudinal Clerkship model within general practice. It is expected this will translate into a more confident transition to postgraduate professional clinical practice. Funding should be sought to test alternative PLC arrangements including: multiple full-time longitudinal placement blocks; or ultimately a year-long longitudinal clerkship programme with an IPE element. Further work should include longitudinal follow-up of SPs.

Impacts On Practice

- Pharmacy Longitudinal Clerkships in general practice, which include supervised clinical practice, increase student pharmacist confidence in managing real-life clinical presentations.
- Prolonged supervised practical clinical placement experience allows utilisation of existing clinical knowledge as well as development and application of clinical skills sets.
- Embedding student pharmacists in multidisciplinary teams has benefits across the professional spectrum in terms of triangulation of professional roles and boundaries.

Introduction

The role of qualified pharmacists is continually being developed across the world. In a recent survey, 28/48 (58%) countries reported that advanced practice frameworks were currently in use or being developed within their country [1]. Within the UK, post-registration curricula from the Royal

Pharmaceutical Society (RPS) have defined the standards required of patient-facing pharmacists working at Foundation [2], Advanced [3] and Consultant [4] levels of practice.

The General Pharmaceutical Council (GPhC – UK Pharmacist Regulator) recently published Initial Education and Training (IET) Standards which, from summer 2026 onwards, permits pharmacists to have prescribing rights at point of registration [5]. If patients and the public are to be assured of the quality of a prescribing pharmacist clinician workforce, then the delivery of pharmacist IET needs to be significantly augmented and adapted to optimise the training environment.

There is a clear understanding within the Scottish Government that there needs to be an increase in SP exposure to clinical practice in terms of experiential learning during the 4 year undergraduate course and funding is now available to support this learning [6]. Exposure of SP to clinical learning environments is anticipated to increase the practical knowledge, skills and behaviours of the postgraduate and post-registration workforce such that they will be able to competently and autonomously manage patients, their diseases and medicines safely from an earlier stage in their professional career and be in a position to begin to develop advanced roles [7] sooner.

At present within NHS Scotland, funded EL placements for SPs are mainly of one week duration. Examples of longitudinal clerkship-type models within pharmacy are limited. Kerr et al reported on an evaluation of a longitudinal placement for 2nd year students within a 5 year pharmacy degree in Ireland and concluded that it promotes learning through curricular integration and interdisciplinary collaboration [8]. These placements related to SPs spending one half-day per week spread over a 13 week semester and were based in the community pharmacy setting.

Medical Longitudinal Integrated Clerkship (LIC) models afford medical students a longer period of continuous time in the same practice [9-11]. Medical students reported greater understanding and appreciation of general practice as a career option pilot students as a benefit of the LIC model [12].

In 2017, the Scottish Government announced that it would test a Pharmacy Longitudinal Clerkship (PLC) programme [13]. PLC offered opportunities for EL and interprofessional learning as well as the development of clinical and consultation skills in managing 'real-life' practice-based clinical scenarios that meet the aspirations for service delivery models of the future. A ten-week PLC pilot, involving two fourth-year SPs from the Robert Gordon University, was completed from November 2018 until January 2019 [14]. The pilot reported increased student confidence in clinical practice, increased enthusiasm for a career in pharmacy as well as General Practitioner positivity for the PLC compared with more traditional limited-duration placements. Building on the learning from the pilot, two further PLC cohorts were evaluated in academic years 2019/20 and 2020/21 – the results of these two further cohorts are published in this paper.

Aim

The aim of this work was to carry out a theoretically underpinned evaluation of the PLC.

Ethical Approval

Ethical approval was sought and granted by the Robert Gordon University School of Pharmacy and Life Sciences ethics review committee (Ethics Approval Number: S150).

Method

This research was undertaken according to an interpretivism philosophy using a qualitative research methodology. Conducting individual semi-structured qualitative interviews with PLC participants was considered the most appropriate method to facilitate in-depth rich data capture and analysis.

Setting

The PLC was based in five GP training practices in the NHS Highland area of Scotland. These GP practices covered a range of rurality based upon the Scottish Government 8-fold Urban Rural Classification [15]. Two practices were in the “other urban area”; one in the “accessible small town”; one in a “remote small town”; and one in a “remote rural” location. Practice list sizes ranged from around 5000 to 15,000 patients.

Sampling and recruitment

Student recruitment was limited to five students each year for two years based on available funding. Applications were open to the whole final-year MPharm group. Applications were shortlisted by panel prior to interview.

GP practices were recruited using a purposive sampling method where all GP training practices within NHS Highland who had experience of hosting University of Dundee LIC students were invited to participate.

All GP clinical tutors and all SP were invited via email to participate in the qualitative interviews. There were no exclusions.

Data Collection

The interview schedule for the semi-structured interview was developed from several sources: literature review; PLC pilot topic guide [14] and The Theoretical Domains Framework (TDF). The TDF summarises key elements of 33 theories and proposes that determinants of behaviour cluster into 14 domains [16]. Those domains most relevant (e.g. knowledge, beliefs about capabilities and consequences, motivation and goals, environmental context and resources) were used to guide construction of interview core questions as they allowed systematic consideration of behaviours that linked directly to the views and experiences of members of stakeholder groups and their involvement in the PLC. Credibility of the interview schedule was enhanced through review of the draft by key expert researchers and practitioners.

Each stakeholder was provided with study information sheet prior to obtaining informed consent. The researchers (CI and TJ) trained in carrying out individual semi-structured interviews conducted either face-to-face in the workplace or telephone interviews, depending on what was convenient for the participants.

Data Analysis

Qualitative interviews were audio-recorded, transcribed naturalistically verbatim, and checked for accuracy. The data generated were analysed thematically [17] using an interpretivist approach. Data was uploaded to NVIVO to facilitate coding. The initial coding framework developed based on the main sections of the interview schedule and using the TDF as a thematic guide. This was then applied to one interview by different researchers. This was then modified and refined and applied to subsequent interviews independently by two experienced qualitative researchers (CI and LK). The processes and stages of analysis were overseen at all stages by a Professor of Pharmacy (SC) who mediated on any disagreements that could not be resolved through discussion by the analysis team.

Illustrative quotes were selected through team discussion. The quotes and themes were used to produce a textural description of the theme and a structural description of the context or setting that influenced participants' experience. These were then used to create a composite statement of the "essence" of the evaluation themes.

Saturation of themes was explored by considering the adequacy of the number of interviews in each group [18]. Credibility was assured as described above. Transferability was assured through detailed reporting of the research process and inclusion of characteristics of the interviewees and their settings. Dependability arose within the process of data analysis through repeated listening and review of transcripts. Lastly confirmability was enhanced through regular meeting and discussion of the research processes with the whole research team and through inclusion of verbatim illustrative quotes from participants to support the thematic narrative.

Results

Five SPs were recruited to the 2019/20 cohort; of these, three SPs completed the ten-week block and two SPs partially completed the placement, leaving after six weeks. Five SPs were recruited to the 2020/21 cohort; of these, two SPs were unable to start due to international travel restrictions imposed during COVID. The duration of the 2020/21 PLC also had to be shortened due to COVID quarantine requirements prior to attendance on placement and was expected to run for eight weeks in total. Of the three SPs in 2020/21 undertaking PLC: one SP completed the eight week PLC, one SP completed six weeks, and the other SP completed five weeks. PLC had to be stopped early for the last two students due to Scottish Government legislation limiting travel during the COVID pandemic. Neither student willingly dropped out. All SPs spent three days per week in practice and the other two days on coursework while on the PLC.

Individual qualitative semi-structured interviews were conducted with seven SPs (19/20 cohort n=4; 20/21 cohort n=3) and five GP tutors. One GP tutor was unable to be contemporaneously interviewed due

to COVID workload. Two of the five GP tutors were involved with both cohorts and so were interviewed once. 2019-20 interviews: one GP was interviewed in person, three GPs by phone, four SPs in person. All 2020-21 interviews were completed by phone: one GP and three SPs. GP interview mean 42mins (range 35-50mins); SP interview mean 57mins (range 43-78mins).

In general, participation in the PLC was a positive experience for SPs, including those that withdrew before the end of the placement. This was reflected throughout the interviews. The main themes identified related to: utilisation and practical application of knowledge; triangulation of skills under clinical supervision; confidence building with clinical and patient contact; elucidation of professional roles within GP.

Utilisation and Practical Application of Knowledge

Most of the SPs identified that participating in the PLC had helped them apply their knowledge, realising that applying it with patients was different from theoretical or simulated cases in the university environment.

"I wasn't sure about the application of the knowledge in practice and, I think that extended period of time, where I was exposed to all of that - putting names to illnesses and putting faces to illnesses - just consolidated all that, [...] work from university, for me" [SP1 2019-20]

The most frequently identified gap in knowledge cited by students was "linking" different elements of knowledge together to inform clinical reasoning and decision making and informing diagnosis, management and prescribing.

"It was about bringing that knowledge and understanding of a single disease state and trying to group it so that you know what to question to kind of rule out the most serious illnesses" [SP2 2019-20]

Other identified gaps included depth of knowledge and insight into unknown unknowns.

"I felt like I very much knew the bare minimum or sort of like the top kind of like the surface of what I needed to know, and maybe not the depth of what I needed to know about something" [SP1 2020-2021]

"I realised early on that there was definitely gaps in my knowledge of things I'd already learned, I just didn't know" [SP3 2020-21]

One GP tutor was very impressed with the pharmacy students' knowledge and professional manner throughout her placement. However, the opinion on pharmacy students' knowledge did vary across the GP tutors.

"It was fantastic the knowledge they did bring actually ... the pharmacy knowledge. I mean, that was actually really helpful, [...] to bring their expertise, and I think the patients really appreciated that as well." [GP4 2019-20]

SPs also reported how supportive the GP Practice learning environment was:

"For anything that I didn't know, or asked a question about, I was never made, I was always made to feel very included and, yeah, I was never made to feel bad for not knowing" [SP2 2020-21]

Triangulation of Skills under Clinical Supervision

Students also discussed that the PLC helped with application of skills as well as knowledge and recognised that practise of skills within a practice environment is required.

"[I] didn't know the scope of... why you were taking them [basic observations] and how they affected, and how they could be abnormal and what that may indicate, and I think, definitely, PLC gave me great understanding of that" [SP3 2020-21]

"By the time I'd got into fourth year, all the stuff I'd learnt around clinical skills in second year... [taking] blood pressures and stuff like that, I'd forgotten most of it" [SP1 2019-20]

All students reported participation in PLC had improved their communication and consultation skills.

"I feel like mine [communication skills] have come on so much from having my time there, both kind of professionally and with patients" [SP2 2020-21]

"[consultation skills] was something I kind of struggled with initially, to just get the nice balance of professionalism but also keeping it natural as well. But they were all definitely enhanced while I got to spend time in [the GP practice]" [SP3 2020-21]

"Consultation skills is really based on personal experience and maybe doing OSCEs, but OSCEs are quite an unnatural sort of setting, and it's maybe not realistic of how you'd actually speak to a patient" [SP3 2019-20]

One tutor was very complementary of their student's consultation skills with patients and their interactions within the multidisciplinary team.

"[they were] absolutely fantastic at making patients feel at ease. [They were] very human, very real and... just a very caring healthcare professional. Extremely approachable; patients all really liked [them], and [they were] really professional and appropriate with everyone, and very eager and keen to learn" [GP1 2020-21]

Some students also noted the rapid development of practical clinical assessment skills and, for some, the confidence that this gave them:

"...in practice, it happens so quickly, one morning you feel like you really can't do something and by the end of the afternoon you're sort of, oh, that's fine." [SP2 2019-20]

One student commented that they benefited from:

“... seeing patients and sort of thinking about them more from like the holistic point of view, rather than just what’s on their prescription” [SP3 2019-20].

However, one GP expressed that the students could have had better preparation prior to starting PLC – particularly with regards to history taking and succinctly presenting cases:

“Our second student [...] probably didn't come with that same experience ... and therefore ... the most challenging aspect for [them] was actually gaining some confidence and some skills in that patient facing consultation [...] I saw progress on that during the course of [their] time here.” [GP3 2019-20]

Confidence Building with Clinical and Patient Contact

The majority of students reported an increase in confidence having participated in the PLC, with one student commenting:

“If it was on a zero to hundred scale, I think I’m like a hundred times more confident than I was going into the clerkship” [SP1 2019-20]

Students acknowledged that applying and consolidating knowledge and skills during the placement led to increased confidence:

“I think it is about having that confidence kind of in yourself which is quite difficult to start with, to be, you know, there was a few times that folk asked me questions and I was like, oh, I don't know, and then they would tell me the answer and I'd be like, oh, I did know that.” [SP2 2020-21]

In addition, particular aspects of SP increase in confidence are shown in table 1.

One student felt that, in addition to her professional confidence, her self-confidence had also increased commenting:

“I think you come out stronger at the end in so many different ways. In terms of your [...] clinical skills [...] and then like aspects of your own personality as well” [SP3 2020-21]

Elucidation of Professional Roles within GP

All GP tutors had prior experience with undergraduate medical students, and one had co-authored the NHS Education for Scotland Advanced General Practice Clinical Pharmacist Framework [19]. However, only one had experience of supervising SPs, but not as lead tutor. Some GP tutors (n=3) had prior experience of being tutors for medical LIC students.

Most GP tutors saw their role as a supervisory, overseeing the placement and offering support when needed:

“It was just making sure that [they were] okay and adapting the programme to what [they] felt [they] needed at different stages” [GP2 2019-20]

“...trying to give them a good glimpse of general practice, and to enthuse them, in a way, and to get them to understand the complexities of a primary care team” [GP3 2019-20]

The importance of feedback and encouragement from their tutor in addition to exposure to tasks was identified, which led to increased confidence of the students with one commenting:

“I think just the exposure to doing it and, from feedback off my tutor as well, saying, like, it's okay, you are doing the right thing” [SP4 2019-20]

One GP tutor also suspected that this opportunity gave their student a different understanding of a pharmacist's role in practice:

“It gave [them] insight into what you could do as a pharmacist, and certainly [what they] expressed that at the end, is that [they would] never would of thought that [they] would've ended up doing the things that [they] did, and that seeing pharmacists in advanced roles suddenly made [them] think about [their] career in a different way” [GP3 2019-20]

Environmental context and resources

For the majority of SPs the PLC was perceived as a positive learning experience:

“It was just such a supportive environment and I just really, really, I think the way they let me decide when I was ready to do something, but at the same time, gave me an idea of when I should be able to do it. It was just a really nice balance, and I think that actually made me flourish more” [SP3 2020-21]

However, an issue was noted at one site where there was a miss-match of expectations around the knowledge and skill base of SPs:

“Perhaps maybe it was ... an issue to do with their [GPs] confidence in what a pharmacy student knew. I think it was a sort of [a lack of] awareness [from the GP].” [SP3 2019-20]

This was echoed by the student's GP tutor who commented:

“It was difficult to know what [their] knowledge base was meant to be” and “maybe a bit more information about what their training involves, in comparison to medical students... maybe pointing out the differences between the two...” [GP2 2019-20]

One student also reported developing an increased awareness of the importance of lifelong learning commenting:

“It wasn't until I actually started PLC I realised that ... seeing other healthcare professionals, people that were already graduated and were working years, and their attitude towards it was that you're learning, and you can always learn something new” [SP3 2020-21]

It was noted by some of the student pharmacists that interprofessional learning with non-pharmacist healthcare professionals added depth to their learning:

"I think you get definitely a lot, a better range of things to think about and it definitely broadens your mind working with people that are [in] healthcare but different professions" [SP3 2020-21]

"I think the main benefit was that the teaching was different from [that of] a pharmacist, I think. Whenever I've been with a pharmacist it's a lot of like: a question-answer, question-answer, because you know the medication or don't, and with the doctors, it's a bit more holistic" [SP2 2019-20]

"It's useful for any healthcare professional to appreciate what everyone's role is and we haven't really had that exposure [to interprofessional learning] at uni. It's, you know, we've had a few days, but not [had] that long-term really following through with specific patients and continuing that team effort; I think [it] is really important" [SP2 2019-20]

It was identified the importance of supporting the SPs, and encouraging them to work as part of the multidisciplinary team. All GP tutors reported it was important for the student to experience as many of the different health disciplines as possible, to give them the best experience of general practice.

"We tried to really give [them] a chance to experience everything. [They were] offered, a session with midwives, you know, with physios, occupational therapists, the pharmacy team, the social work, district nurses, nurses here, practice nurses, healthcare assistants, doctors, home visits, hospital management, discharge management, terminal care, communication skills, you name it. The front desk, reception, answering phones, gathering information [...] we made sure that, as much as possible, [they] get exposure to every single one of these scenarios" [GP1 2020-21]

Discussion

Statement of key findings

This work provides data on the significant and unique opportunities for SPs of a GP longitudinal clerkship EL placement. Clear benefits were seen by both SPs and GP tutors of embedding SPs in clinical practice for prolonged placement including: utilisation of knowledge; practical application; triangulation of knowledge and skills under clinical supervision; confidence building with clinical and patient contact; elucidation of professional roles within a General Practice environment. PLC has demonstrated the benefits of teaching and application of clinical and communication skills within the practice setting, with ease of access to patients and the wider healthcare team, rather than in the setting of a university campus.

Strengths and Limitations

A key strength of this study is that it provides valuable information on SP and GP tutor views and experiences of a PLC. Such information is lacking in the published literature. The trustworthiness of the

qualitative research process has been strengthened by reporting the study in line with COREQ guidelines [20].

Limitations of this work include the small number of participants and the effect of COVID regulations on participants' ability to undertake the full placement. However, those adversely affected by COVID regulations still reported a positive learning experience. There exists the potential for bias in the collection of the data due as all SPs and GPs would know the researcher conducting the interviews. While both SPs that opted to stop the PLC early were invited to interview, only one was able to participate. Some aspects may not be directly transferable to other settings or countries.

Interpretation

This PLC is entirely compatible with the recently published GPhC IET Standards where there is an aspiration that pharmacists will play a much greater role in providing clinical care to patients, as clinicians [5]. There is clear evidence in this research of increased SP confidence from experiential consolidation of knowledge and expansion of clinical skills. This is likely as a consequence of high-quality clinical preceptorship, rather than simply exposure to patients in clinical environments. To create credible and useful clinicians from our pharmacy degrees, similar EL opportunities are essential. The pharmacy profession should be looking to reduce reliance on GPs by developing high-quality pharmacist clinical supervisors.

A key opportunity arising from the PLC is the potential to explore the possibility of expanding IPE [21-23] within experiential settings to complement classroom based or simulation based education activities [24].

Further Research

Consideration has been given to the future of the PLC by the Scottish Government. An adapted "longitudinal placement" model will now become part of the EL offered within multiple pharmacy sectors in any remote and rural area within Scotland. To fit with timetabling constraints these "longitudinal placements" will occur at the same site over multiple separate full-time EL placement weeks, rather than as one continuous part-time clerkship placement block. Further research is required to determine the effect of this change in structure.

Given the success of PLC in terms of meeting the objectives of developing a SP clinician product, further pilot schemes should be considered which would see SPs given similar EL placement opportunities to other student healthcare professionals. Year-long clerkships at undergraduate level should be piloted to explore the benefits of entirely immersive EL clerkships for SPs. Given the pre-existing medical clerkships and the positivity around interprofessional working outlined, consideration should be given by Scottish Government and NES as to IPE longitudinal clerkships.

Further research should focus on interprofessional education opportunities within PLC and longitudinal follow-up of SPs to determine the success of the programme.

Conclusion

This research demonstrates the benefits of embedding SPs within clinical teams and immersing them in a clinical environment over a prolonged period of time as part of a Pharmacy Longitudinal Clerkship model within General Practice. Responses were positive in terms of SP and GP tutor experience in relation to application and triangulation of knowledge and skills under clinical supervision. It built confidence in SPs in relation to practical application of their clinical knowledge, skills and behaviours which will ease their transition to postgraduate professional clinical practice.

Immediate adoption of PLC, as proposed, will see repeated exposure of SPs during EL weeks throughout the year. However, funding should be sought to test alternative PLC arrangements including longer full-time blocks or ultimately year-long EL placements with an IPE element for SPs should be considered.

Declarations

Acknowledgments

The research team would like to thank the following individuals. All patients who consented to being seen by the PLC students during their placement. Dr Katie Walter - Cairn Medical Practice; Dr Moira McKenna – Dingwall Medical Group; Dr Paula Starritt – Grantown Medical Practice; Dr Debbie Miller & Dr Alice Scriven - Nairn Healthcare Group; Dr Jim Douglas – Tweeddale Medical Practice; for all the time and support which they gave to the PLC students and without whom, the PLC would not have been possible. The former CPO for Scotland Professor Rose Marie Parr, current CPO Professor Alison Strath and Postgraduate Pharmacy Dean at NHS Education for Scotland Professor Anne Watson for support of this initiative. All staff who gave of their time to supply the PLC students with tutorials and support while on placement. Dr Tesnime Jebara (TJ) for support in interviewing and manuscript formatting.

Funding

This study was funded by NHS Education for Scotland.

Conflict of interest

Nothing to declare.

CRediT author statement

Innes C: Data curation; Formal analysis; Investigation; Project administration, Writing - review & editing. **Cunningham S:** Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Roles/Writing - original draft; Writing - review & editing. **Addison B:** Project administration, Writing - review & editing. **Wedekind Y:** Project administration; Writing - review & editing. **Watson E:** Conceptualization, Funding acquisition; Writing - review & editing. **Rudd I:** Conceptualization, Funding acquisition; Writing - review & editing. **Power A:** Conceptualization, Resources,

Writing - review & editing; **Karim L**: Data curation; Formal analysis; Investigation; Writing - review & editing; **Rushworth G**: Conceptualization, Funding acquisition; Investigation; Methodology; Project administration, Roles/Writing - original draft; Writing - review & editing.

References

1. Bates I, Bader LR, Galbraith K. A global survey on trends in advanced practice and specialisation in the pharmacy workforce. *Int J Pharm Pract*. 2020;28:173-81.
2. Royal Pharmaceutical Society. Post-registration Foundation Pharmacist Curriculum. 1st ed. London: RPS; 2021.
3. Royal Pharmaceutical Society. Core Advanced Pharmacist Curriculum. Available at: <https://www.rpharms.com/development/credentialing/core-advanced-pharmacist-curriculum>. Accessed Nov 4th, 2021.
4. Royal Pharmaceutical Society. Consultant Pharmacist Curriculum. 1st ed. London: RPS; 2020.
5. General Pharmaceutical Council. Standards for the initial education and training of pharmacists. 2021; Available at: https://www.pharmacyregulation.org/sites/default/files/document/standards-for-the-initial-education-and-training-of-pharmacists-january-2021_0.pdf. Accessed Jan/20th, 2021.
6. NHS Education for Scotland. Experiential learning for student pharmacists in Scotland. 2020; Available at: <https://www.nes.scot.nhs.uk/our-work/experiential-learning-for-student-pharmacists-in-scotland/>. Accessed April/20, 2020.
7. Forsyth P, Rushworth GF. Advanced pharmacist practice: where is the United Kingdom in pursuit of this 'Brave New World'? *Int J Clin Pharm*. 2021;43:1426-30.
8. Kerr A, Boland F, Pawlikowska T, et al. Early longitudinal community pharmacy placements: Connection, integration and engagement. *Research in Social and Administrative Pharmacy*. 2021;17:1313-20.
9. Norris TE, Schaad DC, Dewitt D, et al. Longitudinal integrated clerkships for medical students: an innovation adopted by medical schools in Australia, Canada, South Africa, and the United States. *Acad Med*. 2009;84:902-7.
10. Worley P, Couper I, Strasser R, et al. Consortium of Longitudinal Integrated Clerkships (CLIC) Research Collaborative. A typology of longitudinal integrated clerkships. *Med Educ*. 2016;50:922-32.
11. McKeown A, Mollaney J, Ahuja N, et al. UK longitudinal integrated clerkships: where are we now? *Educ Prim Care*. 2019;30:270-4.
12. Bartlett M, Dowell J, Graham F, et al. Dundee's Longitudinal Integrated Clerkship: Drivers, implementation and early evaluation. *Educ Prim Care*. 2019;30:72-9.
13. The Scottish Government. Achieving excellence in pharmaceutical care: a strategy for Scotland. Edinburgh: Scottish Government; 2017.
14. Innes C, Rushworth G, Addison B, et al. An innovative general practice based pharmacy longitudinal clerkship: using theory to characterise its development, implementation and initial evaluation. *Educ*

- Prim Care. 2021. <https://doi.org/10.1080/14739879.2021.1996275>.
15. Scottish Government. Scottish Government Urban Rural Classification 2016. 2018; Available at: <https://www.gov.scot/publications/scottish-government-urban-rural-classification-2016/pages/2/>. Accessed Nov 4th, 2021.
 16. Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implem Sci*. 2012;7:37.
 17. Gale NK, Heath G, Cameron E, et al. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol*. 2013;13(1):117. <https://doi.org/10.1186/1471-2288-13-117>.
 18. Francis JJ, Johnston M, Robertson C, et al. What is an adequate sample size? Operationalising data saturation for theory-based interview studies. *Psychol Health*. 2010;25:1229-45.
 19. NHS Education for Scotland. General Practice Clinical Pharmacist: Competency and Capability Framework. 1st ed. Edinburgh: NES; 2016.
 20. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19:349-57.
 21. Kent F, Glass S, Courtney J, et al. Sustainable interprofessional learning on clinical placements: the value of observing others at work. *J Interprof Care*. 2020;34:812-6.
 22. Jebara T, Power A, Boyter A, et al. Student pharmacist practice-based interprofessional education in Scotland: A qualitative study of stakeholders' views and experiences. *J Interprof Care*. 2021;1-10. <https://doi.org/10.1080/13561820.2021.2011843>
 23. Jebara T, Thomas I, Cunningham S, Rushworth GF. Pharmacy and medical student IPE placement week. *Clin Teach*. 2022;1-7. <https://doi.org/10.1111/tct.13450>
 24. Rushworth GF, Innes C, Macdonald A, et al. Development of innovative simulation teaching for advanced general practice clinical pharmacists. *Int J Clin Pharm*. 2021;43:817-24.

Table

Table 1: Aspects of student pharmacist confidence increased by Pharmacy Longitudinal Clerkship participation

Aspect of confidence	Quotation
Increased confidence in speaking to patients in general and in asking follow up questions	<i>"I feel confident... digging a bit deeper with the answers they give me" [SP4 2019-20]</i>
Increased confidence speaking to patients due to a better understanding of patient-centred care	<i>"I just feel like it's [talking to patients] going to be a lot easier because the whole idea of the patient centred approach is a bit more clear" [SP2 2019-20]</i>
Increased confidence in their own decisions and being decisive	<i>"just more comfortable in my own decisions that I was making... that they were the right decisions. I was second guessing myself a lot less than I was at the beginning" [SP4 2019-20]</i>
Confidence in own knowledge	<i>"I definitely think the PLC programme has made me be like, no, you know it's right, and just kind of have that confidence in myself that, no, you know it's right, you've learnt this, you know it's, you know, you know what you're doing - so a lot of more in that sort of instances, I can be a lot more decisive and I know that I, to have the confidence in myself that I know that it's right" [SP1 2020-21]</i>
Knowing limitations of own knowledge and competence	<i>"I think kind of knowing my limitations was another thing that I just kind of grew a bit of confidence just to say "Oh, I don't think I can do this"" [SP2 2020-21]</i>
Feeling comfortable dealing with the unknown	<i>"it's also about feeling comfortable with the unknown and things that just pop out, out of the sudden, and just kind of dealing with those things, and having a checklist, in my head, and all of that contributes to how confident I am in my practice doing different things" [SP2 2019-20]</i>
Picking up on "red flags"	<i>"There was quite a few red flags that I might not have picked up on if someone had said to me, or related to a problem, but now I think I'd be a lot more comfortable to do that" [SP2 2020-21]</i>
Abbreviations: SP = Student Pharmacist; PLC = Pharmacy Longitudinal Clerkship.	