Early longitudinal community pharmacy placements: connection, integration and engagement

Abstract

Background

Longitudinal placements are defined as involving "a regular, recurrent placement in the same setting with the same supervisor over a period of time". "Continuity" is the organising principle for promoting learning through continuity of care, curriculum and supervision. Longitudinal placements are widely used in medicine, but less is known about their use in pharmacy and whether the educational principles translate to community pharmacy practice.

Objective

This study sought to explore if a longitudinal community pharmacy placement (LCPP) for Year 2 pharmacy students promoted learning through student patient-centeredness, curricular integration, and growing professional engagement.

Methods

An explanatory mixed methods study design was used. Quantitative data for the study was collected prior to and after the LCPP using a questionnaire incorporating a validated measure of professional engagement and items relating to patient-centeredness and curriculum integration. Pre and post- responses were compared using the Wilcoxon-signed rank test. To further understand the quantitative findings, semi-structured interviews were conducted with students, supervisors and practice-educators and thematically analysed through a constructivist lens.

Results

There was a 78% response rate (47/60 paired responses) to the questionnaire and 25 interviews were conducted. There was quantitative and qualitative evidence of patient connection during LCPPs, yet some students had limited opportunities to connect with people. Curriculum integration was enhanced by the longitudinal nature of the placement. There was a significant increase in the sum scores of the S-PIPE instrument indicating enhanced professional engagement. Qualitatively there was evidence that engagement was promoted through role modelling and supervision, but continuity was compromised with changing supervisors.

Conclusions

An early LCPP promotes learning by providing opportunities for curriculum integration and professional engagement. It may be worth considering as a way to enhance integration through experiential learning in curriculum design. The placement needs to be of a sufficient length to enable repeated patient interaction and ideally provide continuity of supervision for maximum benefit.

Keywords

Longitudinal Practice Placement, Experiential Learning, Professional Engagement, Curriculum Integration, Health Professions Education, Pharmacy, Pharmacy Education

Introduction

Longitudinal placements involve "a regular, recurrent placement in the same setting with the same preceptor (and the same patient base) over a period of time"[1] and are widely used in medicine internationally.[2-5] They are further defined as integrated clerkships when the intention is to provide "experiential clinical learning of all core specialist disciplines concurrently".[1] Longitudinal integrated clerkships require students to spend extended time in a practice setting, where experiential learning opportunities are linked to the curriculum.[6]

"Continuity" is the organising principle which promotes learning in longitudinal placements.[7] Educational continuity incorporates motivation, horizontal and vertical integration and professional development.[1, 7, 8] Clinical continuity fits with the theory of adult learning and its progressive development of knowledge and skills through experience.[7] Longitudinal learning also resonates with adult learning theory in the emphasis on experiential learning, problem solving, self-direction and relevance of defined learning outcomes to students' current and future practice.[1] Longitudinal placements promote learning by establishing more opportunities for connection with patients ("continuity of care"), integrating knowledge, skills and attitudes, horizontally and vertically and across science and practice ("continuity of curriculum") and by enhancing supervision, role modelling and mentoring ("continuity of supervision").[7] Continuity of care enhances student understanding of how illness affects patients and families, promoting rapport building, compassion and caring.[1] Continuity of supervision, through extended contact with the same supervisor, allows students to feel comfortable as well as useful.[1, 9, 10] There is evidence that over time students get to know their supervisor and the team and understand the

workflow of their placement setting. As a result they find it easier to ask questions, discuss their learning needs and receive feedback.[1] Educational continuity incorporates horizontal integration, and vertical integration.[1,7-9] Continuity of care gives students an enhanced understanding of how illness changes and its effects on patients and families, promoting a patient-centred approach, rapport building, compassion and caring.[1]

There is evidence that integrative longitudinal primary care placements have been beneficial in medical education.[1, 12-14] A systematic review on longitudinal placements concluded that they promote learning through engaged participatory learning and clinical experiences.[1] Early studies showed that main benefits were enhancement of communication and clinical skills.[1, 12] Later studies found broader benefits including improved curriculum integration[1], increased confidence[12] and ability to deal with ambiguity.[7] Increased patient-centeredness, advocacy and preparedness for patient care were also found and were sustained over time.[13]

A BEME guide on longitudinal placements identified that the predominant forms of continuity were one or more of patient care, supervision and mentorship, peer group and location. The reason for longitudinal placement design was to achieve such continuity. The most important of these were found to be continuity of patient care and of supervision or mentorship.[1]
Furthermore, for integrated clerkships, students described that they found the integration of modules and placement useful and helped them to identify and/or fill gaps in their knowledge through continuity of curriculum.[1, 15]

Debate remains on how long a placement needs to be in order to be 'longitudinal', with respect to expected effects, with a reported range from 6 to 54 weeks.[1, 3, 14] Whilst there is no definition

of the required duration, in order to be defined as longitudinal a placement,[2, 3, 14] a BEME guide of longitudinal placements defined a minimum requirement of 13 weeks.[1]

Medical education literature identifies the factors for successful longitudinal placements. They require careful planning of learning outcomes, curriculum integration, duration and selection of suitable, quality assured, placement sites.[6, 16, 17] Supervisors require training and a connection with the educational institution.[3, 16] Students require preparation for appropriate professional behaviour, with the opportunity for regular check-ins and debriefing. Challenges have arisen where students have not been able to follow-up patients as often as they would have liked,[11] professional boundaries have been stretched[9] and conflicts have arisen with supervisors.[1, 10, 16]

Longitudinal placements have not, however, been widely reported in pharmacy education literature,[18] therefore, the evidence for how longitudinal placements work in a pharmacy context requires further exploration. The design of a new integrated pharmacy programme, as part of an overall curriculum reform to comply with regulatory requirements for a fully integrated programme, provided an opportunity to introduce a LCPP and explore the outcomes.[19] The placement being studied lasted thirteen weeks, with twelve practice days. It needs to be explored if this is long enough for the student to feel part of the team. The LCPP was designed for students to meet learning objectives including: describing care provided in community pharmacy; communicate with patients; develop a patient-centre approach to patient-care; appreciate that patient care is provided through the efforts of a multidisciplinary team; integrate the basic science with professional practice from the taught modules; reflect on the role of the pharmacist as an advocator, communicator, collaborator and provider of patient- centred care.[20] The

placement design was influenced by the intention to promote patient-centeredness, curricular integration, and professional engagement. This study is designed to investigate if and how the LCPP promotes learning in order to begin to provide evidence for pharmacy educators if and how longitudinal placements work in practice, in a pharmacy context.

Research Question

Does an early longitudinal community practice placement for pharmacy students promote learning by establishing more opportunities for student patient-centeredness, curriculum integration and to grow professional engagement? This mixed-methods study was designed to explore student and supervisor experiences.

Methods

An early LCPP was designed for a new 5-year pharmacy programme in X (institution) in Ireland, based on best practice and published guidance of longitudinal placements internationally.[3, 8, 17-20] The Pharmaceutical Society of Ireland, the pharmacy regulator, mandated the introduction of a 5-year integrated pharmacy programme, to replace the previous 4 year followed by pre-registration year. The previous model involved no formal experiential learning until the pre-registration year.[19, 21, 22] There was a requirement to integrate experiential learning throughout, but flexibility as to how experiential learning was to be delivered in the early years. The LCPP was designed as one half-day per week in the same community pharmacy for the duration of the second semester in Year 2 of the programme. This lasted 13 week and with one reading week, students had 12 placement half-days. The placement integrated with college-based modules in immunology, infection and sensory and protective structures (eye, ear, nose and skin). Integrative experiential learning activities were included in the student workbook, such as dispensing antibiotics and observing eye drop counselling. Students were required to engage with one patient during their placement to promote patient interaction. Students were supervised in their placement by a community pharmacist supervisor. Practice educators trained supervisors, prepared students for placement, conducted placement check-ins and assisted with debriefing.

Study Design

Designed as a sequential explanatory mixed methods[23-27] study consisting of a questionnaire administered prior to commencement of their LCPP and after completion of the placement,

followed by semi-structured interviews. Participants were all Year 2 pharmacy students in X (space saver to name institution). The questionnaire was given to all second year MPharm students (see Appendix One). A purposive, snowball sample of students, who had completed questionnaires, and pharmacists (practice educators and supervisors) took part in semi-structured interviews.

Data Collection

Pre- and post-placement data was collected using the Student Pharmacist Inventory of Professional Engagement (S-PIPE) tool.[28] This instrument was developed to measure professional engagement in students with a focus on capturing the cognitive affective state of engagement within the profession[28]. This instrument asked students to rate how often they felt agreement with each statement. The frequencies and scores for this section are detailed in Table 1.

Table 1 Frequency description for S-PIPE instrument

Never	Almost Never	Rarely	Sometimes	Often	Very Often	Always
0	1	2	3	4	5	6
Never had this feeling	A few times a year	Once a month	A few times a month	Once a week	A few times a week	Every day

The items in the S-PIPE tool map to three sub-scales of belonging, connectedness and meaningful experience (Table 2). The Cronbach's alpha score (a measure of internal consistency) for each subscale were reported by authors in its initial design use belonging (a ¼ 0.942, 9 items), connectedness (a ¼ 0.864, 3 items), and meaningful experience (a ¼ 0.760, 4 items).[28]

Table 2 Items from the S-PIPE tool mapping to each of the sub-scales, belonging, connectedness and meaningful experience

Belonging • Being a part of the profession energizes me • I am proud to be a student pharmacist • I will strive to advance pharmacy practice • I am excited about the future of pharmacy • I will have a positive impact on the profession • I feel involved in my profession • As a student pharmacist, I can make a positive difference • I feel connected to others in the profession • I feel like I belong in pharmacy
Connectedness • Someone in the profession cares about my professional development • Someone in the profession cares about me • I have someone I look up to in the profession of pharmacy
Meaningful experience • As a student pharmacist, I can help others • I have inspiring conversations about pharmacy • What I do as a student pharmacist is valuable • I have the opportunity to apply what I have learned

The pre-placement questionnaire also included 7 items relating to student patient-centeredness. Some of these items were derived from the literature; the Patient-Practitioner Orientation Scale was used as a starting point and items relevant to the pharmacy profession were used[29] and others derived from experience of the team and the Pharmacy Education and Accreditation Report.[19, 29]The post-placement questionnaire included 9 items relating to student patient-centeredness and 6 items relating to curriculum integration derived from the Pharmacy Education and Accreditation Report.[19] These additional questions were included to aid in answering the student patient-centeredness and curriculum integration aspects of the research question. These items were piloted on a sample of recent graduates, to see the range of responses, obtain additional feedback and estimate time taken to complete questionnaire,

before finalisation and distribution to students. Students were asked to rate their agreement with each statement in these sections as strongly agree, agree, neutral, disagree or strongly disagree. Student demographic information (nationality, age, gender), information relating to the pharmacy and the number of days the assigned supervisor was present was also collected.

Semi-structured interviews were conducted following analysis of the questionnaire data to deepen understanding of student and pharmacist views and experiences of the longitudinal placement. Interview prompts focussed on areas, which needed further exploration, based on significant findings in the questionnaire and free text comments. The interview prompts were developed in order to gain further insight and explanation to some of the significant questionnaire findings, in each of the three sections. Free text comments were also sought from students in the questionnaire and patterns arising from these formed the basis of interview prompts. Interview prompts are included in Appendix Two. As questionnaires were completed anonymously, individual questionnaire responses could not be compared with the students' interview. Students, who completed the questionnaire and supervisors, were invited to take part in interviews. There was a maximally variant sample frame, achieved through a gender, age and nationality balance of student participants. A gender balanced sample of supervisors from chain and independent pharmacies, with various years of clinical and supervision experience were interviewed. Data was collected until agreement that saturation had been reached.

Data analysis

Statistical analyses were conducted using SPSS version 25. Appropriate descriptive statistics (e.g. percentages and frequencies, means and standard deviations) were used to describe the student

demographics, pharmacy details and number of days supervisor present. Pre- and post-placement responses were compared using the Wilcoxon signed rank test. Overall mean scores and sub-scale mean scores were used for the S-PIPE, based on guidance from the authors of the tool.[28] No adjustment for multiple comparisons was conducted as this was an exploratory study and sample sizes were small. All interviews were audio-recorded and transcribed verbatim. Thematic analysis[30, 31] was conducted through a constructivist lens[32, 33] using both inductive and deductive approaches. The interviews were all imported into NVIVO, to aid coding, by (first author) in collaboration with the research team. Coding was done in multiple stages to identify and further explore prominent themes as they emerge from the data. Codes and emerging themes were classified in groups including patient-centeredness, professional engagement, curriculum integration and learning. Subgroups each had a continuity section, where emerging themes indicated continuity was at play as well as a general subsection for other relevant aspects of the emerging themes. No themes or subgroups were predefined, although it was anticipated that themes would be able to be classified under areas relating to the research question and emerging topics from quantitative analysis. Some quotes were coded under more than one theme, where they related to multiple areas. The codes and coding were reviewed and agreed upon by the research team to ensure that they reflected the data.

Results

Quantitative

Forty-seven students (n=47/60, 78%) responded to both pre- and post-placement questionnaires. The mean age was 20.87 (Standard deviation (SD +/- 2.48 years), the majority were female (n=36, 77%) and of EU nationality (n=38, 81%). Most students completed their placements in a large pharmacy group (6 or more pharmacies with single owner) (n=19, 41%). Small pharmacy groups (n=11, 24%) and independent pharmacies (n=16, 35%) also hosted placements. The majority of students were supervised by their assigned supervisor for 11-12 of their placement days (n=31, 66%) out of a maximum of 12 days. A small number of students spent less than 5 placement days working with their assigned supervisor (n=5, 11%).

Student patient-centeredness

The majority of students demonstrated patient-centred views (see Table 3). Student agreement with the statements 'Pharmacists should routinely spend part of their professional time working to improve patient care' (p=0.020) and 'It is important to consider a patient's view(s) when making clinical decisions' were significantly (p=0.046) different pre- and post- placement, with an increase in those strongly agreeing after placement.

Table 3 Student agreement with student patient-centeredness items and comparison of pre- and post- patient-centred responses

Statement		**Strongly Disagree n (%)**	**Disagree n (%)**	**Neutral n (%)**	**Agree n (%)**	**Strongly Agree n (%)**	**p-value**
Pharmacists should routinely spend part of their professional	**Pre**	-	-	3 (6.4%)	16 (34.0%)	28 (59.6%)	**0.020**

time working to improve patient care.	**Post**	-	-	-	13 (27.7%)	34 (72.3%)	
The patient is at the centre of everything that I do as a student pharmacist.	**Pre**	-	1 (2.1%)	4 (8.5%)	16 (34.0%)	26 (55.3%)	0.577
	Post	-	-	4 (8.5%)	16 (34.0%)	27 (57.4%)	
When considering if a prescription is appropriate, I think more about the disease rather than the person.	**Pre**	-	28 (59.6%)	10 (21.3%)	1 (2.1%)	-	0.141
	Post	7 (14.9%)	24 (51.1%)	11 (23.4%)	5 (10.6%)	-	
It is important to consider a patient's view(s) when making clinical decisions.	**Pre**	-	-	2 (4.3%)	21 (44.7%)	24 (51.5%)	**0.046**
	Post	-	-	1 (2.1%)	15 (31.9%)	31 (66.0%)	
It is important to gather all information from patients, regardless of how it makes them feel.	**Pre**	-	10 (21.3%)	14 (29.8%)	17 (36.2%)	6 (12.8%)	0.719
	Post	1 (2.1%)	12 (25.5%)	12 (25.5%)	16 (34.0%)	5 (10.6%)	
I prioritise patient-centred care in my role as a student pharmacist.	**Pre**	-	3 (6.4%)	-	18 (38.3%)	26 (55.3%)	0.175
	Post	-	-	2 (4.3%)	15 (31.9%)	30 (63.8%)	
The busy role of a community pharmacist makes it difficult to provide patient-centred care.	**Pre**	-	9 (19.1%)	13 (27.7%)	16 (34.0%)	9 (19.1%)	0.353
	Post	-	7 (14.9%)	11 (23.4%)	17 (36.2%)	11 (23.4%)	
I had the opportunity to make professional connections with a patient during the placement	**Post only**	1 (2.1%)	7 (14.9%)	2 (4.3%)	21 (44.7%)	16 (34.0%)	N/A
The longitudinal nature of the placement provided me with the opportunity to follow up on the same patient.	**Post only**	5 (10.6%)	14 (29.8%)	10 (21.3%)	9 (19.1%)	9 (19.1%)	N/A

Curriculum Integration

The majority of students agreed that the academic programme and the placement were two parts of a single learning experience,[19] and that curriculum integration was supported (see Figure 1).

Figure 1 Student agreement with curriculum integration items post LCPP

Professional Engagement

Following placement, there were significant increases for the mean score and all mean sub-scale scores (Table 4: mean, belonging and connectedness, $p<0.01$ and meaningful experience, $p=0.02$).

Table 4 Mean and Sub-scale scores: mean, standard deviation, median and interquartile range (n=47) and Pre- and post-placement comparison using the S-PIPE tool

Score	Mean	Std. Deviation	Median	Interquartile range	Z (p)
Pre Mean Score	3.81	0.99	4.50	3.22-3.67	-4.328 (<0.01)
Post Mean Score	4.47	0.79	5.05	3.76-4.67	
Pre Belonging	3.95	0.98	4.00	3.22-4.66	-4.153 (<0.01)
Post Belonging	4.57	0.79	4.67	3.88-5.11	
Pre Connectedness	3.47	1.46	3.33	2.66-4.37	-4.199 (<0.01)
Post Connectedness	4.45	1.12	4.66	4.00-5.33	
Pre Meaningful Experience	3.64	1.08	3.50	2.75-4.25	-2.435 (0.02)
Post Meaningful Experience	4.11	0.91	4.25	3.5-4.75	

Qualitative findings

A total of twenty-five semi-structured interviews were conducted to elucidate experiences of the LCPP. Interviews were designed in order to further explore and gain clarity on themes arising from the questionnaires. Thirteen students and twelve pharmacists (10 supervisors and the 2 practice educators) were interviewed until it was agreed that saturation of major themes was reached.

Student patient-centeredness

Major themes relating to patient-centeredness included the benefits of patient interaction, and appreciation of the patient's perspective. Opportunities to engage with patients were described by all stakeholders, although limitations of the frequency or interactions and repeated interactions with the same student were also discussed, which helps to explain limited growth in patient-centeredness.

Student appreciation of the patient perspective and understanding of the importance of involving patients in decisions improved as they interacted with patients. One student described that *'some medicines don't suit certain patients in terms of their idea in taking the medicine' (Student A).* Students also learned from observing their supervisors in practice about the importance of being available to and having good professional relationships with patients: '*You could see week by week how much the pharmacist actually did help them'* (Student G).

Students felt that patient interaction was '*good, in our practice sessions and classes, but it's very fake and you kind of feel a lot more safe….But it's different when you're out talking to actual real people'* (Student D). Pharmacists described seeing their students' confidence and communication improve during the placement; "*I could see him progressing in his confidence. Initially he was very shy and nervous, but by the end of his placement he was engaging and chatting with all customers*" (Pharmacist I).

Some students experienced continuity of care through repeated interactions with the same patients and benefitted from getting to know patients: '*You really kind of got to build up a good relationship with people like that, you know, coming in on a regular basis'* (Student J).

Stakeholder reported the benefits as building relationships with regular patients: '*He got to see like a big variety of patients, and like we have a good few regulars here, and he got to kind of get to know them a bit' (*Supervisor B). However, many students did not get the opportunity to interact with the same patient on more than one occasion, which is necessary to create true continuity. Supervisor pharmacists had difficulties arranging repeated patient interaction for students, suggesting it was due to placement scheduling '*They might have but the fact that it's a Tuesday afternoon you probably wouldn't have a regular person on a Tuesday afternoon'* (Supervisor H). Students also suggested that the timing and duration of the placement day may have limited opportunities for repeated interactions: '*I only got to see them once. To be brutally honest…because they weren't in the pharmacy when I was there'* (Student A).

Curriculum Integration

Themes relating to curriculum integration include linking learning and practice, learning activities promoting integration, contextualising and applying learning. Students felt that the placement and course were well linked: *'I would say it was fairly linked up to what we were doing*' (Student C). Students described being able to link their learning to practice, greater insight into learning and that the curriculum integration '*brought them out from the books and made it real for me'* (Student B). Supervisors agreed: '*They are able to link in everything they are learning in college.' (Supervisor C)*.

Supervisors felt learning activities each week were useful for students to '*follow that up, in a clinical setting…..reinforced what they were learning and maybe gives it a bit of context*' (Supervisor D). Students described the link to their systems-based modules as helpful for their

understanding and retention of knowledge*; 'It was so good for learning the antibiotics…that was one thing I found hard in the infection module...actually trying to remember what each one was for'* (Student G). Students would like to see further integrated placements for other modules. The learning activities and curriculum integration helped stakeholder plan for and provided some structure to the placement.

Continuity of curriculum was widely described by all stakeholders. Students described the benefits of having college in the morning and placement in the afternoon one day a week as *'When you do one day a week you apply whatever you learned that week...You see that antibiotic being dispensed on that day that you were there… and it really enforces it, like you'd learn so much. You get extra information from the pharmacist and it links up really well with the lecture materials as well'* (Student L).

Professional engagement

Themes relating to growing professional engagement include role modelling, professional identity formation and connection with the pharmacy profession.

Role modelling was a key theme and students described positive role modelling by their supervisors such as *'she'd like go out for way to kind of you know let's get your prescription first and then do it up then always bring it out herself if she say didn't get a prescription first just to make sure that the patient's OK.'* (Student C). Students also described professional identity formation, reflecting on good and bad examples of practice with plans on how they will use their learning*; 'So when it comes to, you know, your own career and profession, the future, you can take those good practices that you learned'* (Student J). Many students described how the

placement influenced their view of their future pharmacist career: *'It's made me think about the ways that I want to participate or engage in this practice'* (Student B). Belonging in the profession was described by students, including students who described less growth of professional engagement: *'I definitely felt more like pharmacy was where I am supposed to be'* (Student D).

The longitudinal nature of the placement promoted students to become part of the team due to the prolonged contact with the team; '*In my opinion, the longer interaction over 12 weeks helped in the integration process and us to see the potential. Trust between people is usually built over time*.' (Pharmacist I). Some students did not feel they ever became part of the team. One student, who did not feel more professionally engaged following placement, described*:* '*there was a couple of weeks they said to me, Oh, I didn't realize you're supposed to be here today and I didn't even know you were coming in….And so, I never felt like I was in the team'* (Student D).

Growth of professional engagement depended on student interest in the placement. '*But the student was not super involved in it or not super interested…so you know if they're not going to be interested, I wasn't gonna be interested in it either'* (Supervisor H). Supervisor interest affected student experience of the placement with very positive experiences from interested pharmacists: '*I felt where I was working; they tried their best to involve me in it as much as possible'* (Student E). Less positive experiences were described for those with for less interested supervisors.

Factors such as workload retracted from the active nature of student placements, which in turn may have limited opportunities for growing professional engagement. For example, students, whose supervisors spent time dealing with issues from previous days off retracted from their experience: '*There were a number of pharmacists in and out there…so at times, I thought there was a lack of continuity. A couple of times when I was on placement what might have taken from my interaction time with the pharmacist was people coming in to complain'* (Student A).

Continuity of supervision was somewhat described. Some supervisors described getting to know their student better; '*I suppose you get to know the student a bit better. I think when you see them over a number of weeks as opposed to just having them in for the one week'* (Supervisor F). Many factors inhibited continuity of supervision including having alternating supervisors due to supervisor days off, locum cover, workload and staff shortages. Furthermore, from a pharmacist perspective, continuity of supervision was also inhibited by workload limiting time for interaction with the student: '*And my workload actually at the time, just at the time of the year. From what I remember I was quite busy*' (Supervisor B).

Some students described having their supervisor for only half the placement days. Some students were supervised by another regular pharmacist on their supervisor's day off: '*There's two pharmacists. I had two supervisors, one of them, the main supervisor or the main pharmacist is coming week and off*' (Student H). However, for some of these students, they described feeling like they had less hands-on experience and felt less comfortable on the days when one of the two pharmacists were supervising them. Supervisor pharmacists who were off many days their student had placement, were aware of the difficulty for the students and felt

under pressure to prepare activities for the student: *'I would kind of feel under pressure to like have something ready for them to do.'* (Supervisor G). Some students described being very comfortable and having clear identity as a student, whilst other described situations where they felt less comfortable when a locum pharmacist was present *'I didn't feel comfortable when there's a locum though….But that girl just wasn't bothered, she was just giving one word answer and goes back onto the phone'* (Student L). Other students who did not always have their regular pharmacist enjoyed the experience of being supervised by a locum, often students who did not describe highly positive relationships with their main supervisor or students who had previous pharmacy experience and interaction with locums.

Continuity

The longitudinal placement is underpinned by continuity, and this was explored with interview participants. Some participants felt that the three-hour duration of the day and one week-gap between placement days inhibited continuity, in terms of connection with the team and opportunities for repeated patient interaction: '*I think maybe it could be a little bit longer. You know like even if it was instead of three hours maybe if it was like five or six hours'* (Supervisor B). The duration of the day may also explain limited growth in patient-centeredness and lesser growth in meaningful experience than other professional engagement areas given limited time for interacting and completing what students may feel as meaningful tasks.

Learning

Overall students described the benefits of connecting with people for their learning, including giving greater insight: "*so it really opened my mind to, to not assume that because a person is*

taking this for many months or years then they are on top of their thing. So that was a huge learning for me" (Student B). Connection also improved confidence, communication and curriculum integration helped with knowledge retention. The longitudinal nature of the placement helped students plan their learning, noted by practice educators "*It gives the students a chance to plan*" (Practice Educator A) and students "*it made you think, like, after every day that you went into the placement and you're like, right what do I want to get from next week? And then you prepare yourself for it*" (Student C). Supervisors could also see the benefit of the longitudinal structure "*It's kind of incremental learning. They're learning a little new thing every time. They're kind of refreshing some of what you, what you showed them the last time and I think they gain more confidence*" (Supervisor C).

Discussion

Longitudinal placements are rarely reported in pharmacy despite being widely reported in medicine.[1, 2, 5, 17, 34] This mixed-methods study explored if and how a LCPP can result in possible growth or change in student patient-centeredness, curricular integration, and professional engagement, and the role of continuity.

This study reports increased student patient-centeredness post-placement for two items only. However, patient-centeredness was high to begin with and this was a small sample. Current evidence suggests that longitudinal placements promote connection with patients and communication skills.[1, 12-14] The qualitative data suggested that student connection with patients was promoted with increased awareness of the patients' point of view and increased confidence interacting with patients. The unscheduled nature of patient encounters sometimes made it difficult for students to meet with patients repeatedly, and therefore inhibited continuity of care. Stakeholder concerns about lack of overlapping visiting times and difficulty planning may have overcome somewhat if the duration of the placement day was longer or if placement days were more frequent, rather than once weekly. Evidence from medicine suggests longer placements allow for more repeated patient interaction and longer placement days allow for more interaction each day.[1, 2] Literature in medical education to date has not provided an answer about the optimal duration of a longitudinal placement.[16]

One of the broader benefits of longitudinal clerkships is improved curriculum integration[1] through experiential learning.[35-37] The integrative nature of longitudinal placements, with continuity of curriculum has been reported to have benefits over block or hybrid placements.[2, 3,

[7, 9, 15, 16, 38-40] There was evidence in this study that the LCPP promoted curriculum integration. The integrative learning activities promoted continuity of curriculum. Quantitative and qualitative data illustrated that students were more aware of the relevance of their learning due to the integrating activities on placement. This was particularly important in the design of the LCPP, as it was part of an overall curriculum reform to comply with regulatory requirements for a fully integrated programme.[19]

Growth in professional engagement was promoted by the LCPP through role modelling, professional working relationships and repeated supervisor interactions.[41] The findings from this study were in keeping with research that longitudinal placements allow for increased role modelling in medicine.[43] However, the findings from this study did not fully concur with previous studies in medicine indicating stronger supervisor-student relationships[14, 42]. This is illustrated by qualitative data indicating limited continuity of supervision, which is a key component of a successful longitudinal placement for positive learning experiences[2, 6, 7, 10, 16, 40, 44, 45], to maintain supervisor and student motivation[46, 47] and reduce issues associated with discontinuity in traditional block clerkships.[48] It remains unclear if limited continuity of supervision affected overall growth of professional engagement. Previous studies of pharmacy supervision highlights the importance of role modelling and mentorship, although this does not necessarily need to come from a single pharmacist.[49, 50] Qualitative data illustrated some students felt they had poor supervision, in line with previous studies.[51] This issue merits further exploration to determine if frequency of supervisor contact had a direct impact. The nature of pharmacy practice, where locum pharmacists provide cover for the supervising pharmacist, meant that some students did

not experience regular contact with their supervisor. The impact of locum cover merits exploring.[41, 52-56]. Making it a requirement for the supervisor to be present every week would not be feasible.[57] However, it may be possible to introduce brief training or a training workbook for locums to review and complete in the morning before the student arrives. This is not as prominent an issue in medical education, as the training doctors often work in teams, and it would be more likely that a member of the team trained to supervise would be present for each placement day.[16, 57] A possible alternative solution might be to introduce entrustable professional activities to help create more consistency in the expected level of active learning in the placement.[56, 58] Entrustable professional activities may help limit the dependency on consistent supervision and promote growth of professional engagement, communication and self-awareness.[59]

Limitations

We were limited to a single year group from a single institution completing the placement, which resulted in a relatively small sample size for the quantitative study. Whilst the S-PIPE[28] is a validated tool for pharmacy students in the United States, the other items were piloted with this population but not validated. The S-PIPE[28] has not previously been reported in a pre- and post- fashion, which may be a limitation, although it may have potential in this regard.

Conclusions

In this study, there was growth in quantitative measures of connecting with patients, curriculum integration, and professional engagement. To explain this growth, interviews were completed with students and pharmacists. Analysis of their qualitative experience unearthed the

importance of relationships with patients and preceptors. Despite the importance of continuity of these relationships, some students and pharmacists noted that the structure of longitudinal placements made it difficult to establish longitudinal connections with a single patient (i.e. following a single patient over time), and resulted in variation between students as to the frequency with which they were working with their supervisor compared to another pharmacist. The qualitative component also illustrated that the placements helps to grow professional engagement through role modelling and professional identity formation. The longitudinal nature of the placement promoted curriculum integration, through learning activities linking current modules to practice, allowing students to apply their learning in a timely manner. The design of a LCPP should take account of the duration, to ensure that it is of sufficient length to promote repeated patient interaction.

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Competing Interests

The authors declare no competing interests.

Ethical Approval

This study has been approved by the institution's Research and Ethics Committee; REC1621.

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