

# South African pharmacy student perspectives of a hospital-based experiential learning programme

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## Abstract

**Context:** As pharmacy educators introduce or extend hospital-based experiential learning programmes (ELPs), an insight into the student experience can inform the future design and planning of ELPs.

**Aim:** To describe and explore the lived experiences of final year pharmacy students participating in a hospital-based ELP in South Africa.

**Methods:** A qualitative descriptive research design was utilised, with data obtained from four focus groups over two consecutive academic years. Data collection occurred prior to, and on completion of the ELP using a non-probability purposive sampling technique.

**Results:** The emergent themes were: the clinical environment; integration and application of knowledge; inter-professional relationships and professional identity; and self-perceived level of preparedness. The expectations of the students prior to commencing the hospital-based ELP were realistic and positive, but the lived student experiences highlighted several areas of concern.

**Conclusions:** While the overall educational experience of the ELP was positive, areas requiring intervention were identified.

**Keywords:** *Clinical Training, Experiential Learning, Focus Groups, Pharmacy Education, Qualitative Research*

## Introduction

Pharmacists are no longer restricted to the provision of medicines but now offer a range of patient-focused services designed to meet the medicine-related needs of the patient (FIP, 2012). As a result, today's pharmacy graduates not only require relevant discipline-specific knowledge but must also be able to apply pharmacological and pharmaceutical knowledge to problems encountered in the practice and clinical settings (Wiedenmayer *et al.*, 2006; Blouin, Joyner, & Pollack, 2008). This extended role of the pharmacist requires development of skills in the areas of clinical practice, problem solving and decision making, as well as in interdisciplinary teamwork (Jungnickel *et al.*, 2009; FIP, 2012). Thus, pharmacy educators have had to revise curricula in order to meet the profession's need for these new applied clinical skills.

The expanding role of the pharmacist has also highlighted the need to increase the exposure of undergraduate pharmacy students to experiential learning in a patient-centred environment through clinical placements (Hudson, McAnaw, & Johnson, 2007; Haase *et al.*, 2008; Rathbun *et al.*, 2012). Several countries such as Australia, New Zealand, England and the United States of America have identified the need for increased experiential training in undergraduate pharmacy curricula with varying degrees of implementation (Haase *et al.*,

2008; Sosabowski & Gard, 2008; Owen & Stupans, 2009; Oderda *et al.*, 2010; Hall *et al.*, 2012). In South Africa, the revised four year Bachelor of Pharmacy degree (B.Pharm.) was registered with the South African Qualifications Authority (SAQA) in June 2012 and, in line with international trends, the revised qualification stipulates that providers of pharmacy education in South Africa must include structured experiential learning periods in the undergraduate curricula, accumulating to a minimum of 400 hours over the four year programme (SAQA, 2012).

The inclusion of experiential learning as a key component of pharmacy education has not been without problems. Owen and Stupans (2009) reviewed experiential placements in Australian pharmacy programmes and identified a need for more comprehensive planning, clear identification of roles and responsibilities of the universities, students and preceptors in the workplace, and a scaffolding of learning linked to competency and various assessment tasks. Similar recommendations were suggested by Katajavuori *et al.* (2009) three years after pharmacy education curriculum reform in Finland. In the United Kingdom (UK), logistical problems were reported with experiential learning such as a lack of clinical sites and the availability of suitably trained preceptors (Sosabowski & Gard, 2008). Although problems have been identified and

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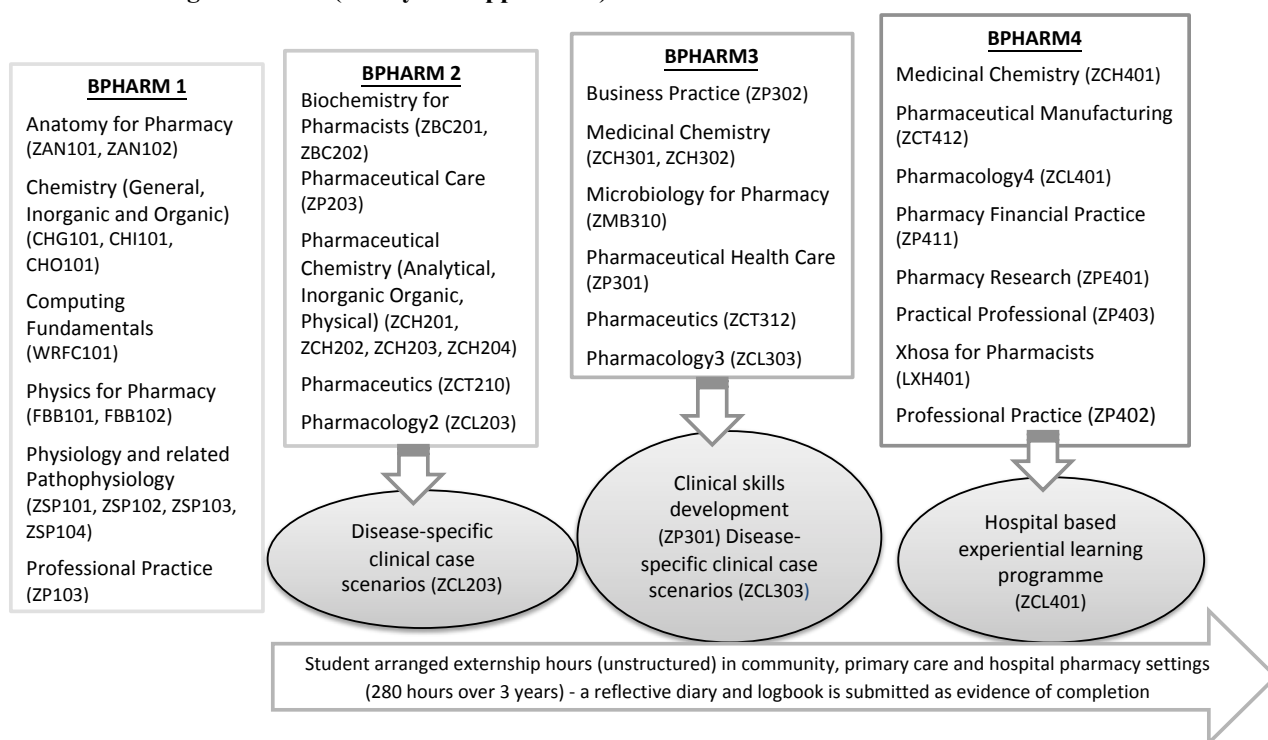
challenges encountered, the need to include work-based learning in pharmacy education has not been questioned. The concerns raised tend to focus on the practical logistics of placing students with appropriately trained preceptors, and the need to ensure that the work-based placement delivers a positive learning experience that is well integrated with the academic content of the pharmacy curriculum. Undergraduate pharmacy students in experiential placements often find that learning ‘just happens’ in an unstructured and uncontrolled environment (Stupans & Owen, 2009). Students may experience difficulty in applying discipline-specific knowledge in an experiential learning environment, which typically tends to be unstructured and complicated by multiple factors which impact on the decision making process. Difficulty in application of knowledge when problem solving and clinical decision making has been reported with pharmacy, medical, nursing, occupational health and other students in the health sciences (Profetto-McGrath, 2003; Blouin *et al.*, 2008; Macpherson & Owen, 2010; Smith *et al.*, 2010). Coupled with this, students may be overwhelmed in the unfamiliar environment, resulting in impaired learning.

As pharmacy educators revise curricula to include increased experiential hours in the undergraduate programme, a greater understanding of the factors affecting student achievement in ELPs is required. Previous research has focused on factors contributing to academic success in pharmacy programmes rather than in the ELP itself (Sansgiry, Bhosle, & Sail, 2006). The perceptions of students on completion of their first introductory pharmacy practice rotations in community

pharmacies, as well as the perceptions of the preceptors and pharmacy educators have also been well documented (Fejzic, *et al.*, 2013; Danielson *et al.*, 2015). However, there appears to be little descriptive information from the perspective of undergraduate pharmacy students during the introductory exposure to clinical settings such as hospitals. As pharmacy educators move towards expanding their hospital-based ELPs, an insight into the student experience could inform the design and planning of experiential programmes.

In South Africa the entry level qualification for pharmacists is the four year B.Pharm. degree, which is currently offered by nine universities. Pharmacy graduates then complete a 12 month pre-registration training period, working as a pharmacist intern under the supervision of a qualified pharmacist. On successful completion of the internship and the pre-registration assessment, the intern is then registered with the South African Pharmacy Council (SAPC) as a pharmacist and must complete one year of community service in a government healthcare facility before full registration (SAPC, 2015). Currently in South Africa, registered pharmacists with an interest in clinical pharmacy have begun to provide clinical ward-based pharmacy services in a growing number of hospitals. The emerging role of the clinical pharmacist in South Africa is gaining recognition and acceptance, largely as a result of active participation of pharmacists in antimicrobial stewardship programmes (Suleman & Meyer, 2012; Mendelson & Matsoso, 2015; Messina, van den Bergh, & Goff, 2015). On 12<sup>th</sup> December 2014, the SAPC published the draft document detailing the scope of practice and

**Figure 1: The B.Pharm. curriculum at Nelson Mandela University showing the progressive development of clinical knowledge and skills (theory and application)**



qualifications for specialist pharmacists (SAPC, 2014), and thus confirmed the intention of the SAPC to recognise pharmacists as experts in their fields of practice, with the ‘Clinical Pharmacist’ identified as one of the categories of specialist pharmacists. Although clinical pharmacy competencies are typically developed at the level of postgraduate education, South Africa, like most developing countries within sub-Saharan Africa, is faced with high disease burdens. Thus there is a real and urgent need for newly qualified pharmacy graduates to possess patient-focused clinical skills, in order to optimise medication regimens.

Undergraduate pharmacy curricula in South Africa are based on the four major disciplines of Pharmacology, Pharmacy Practice, Pharmaceutics and Pharmaceutical Chemistry. Experiential learning (EL) has been included in the Nelson Mandela University undergraduate pharmacy programme for more than 20 years. The current research was conducted immediately prior to the development and implementation of the new revised B.Pharm. curricula, with the intent of informing the curriculum development process (specifically the expansion of the EL programme). In the B.Pharm. programme undergoing revision at Nelson Mandela University, the pharmacy students are first introduced to the workplace environment in the second year when each student is required to complete a minimum of 80 externship hours in a community pharmacy setting for the Pharmacy Practice modules, with a further 160 hours completed over the third and fourth years. The externship hours are unstructured experiential hours spent in the workplace and are organised by the students to take place during recess periods or over weekends or evenings.

Pharmacology is presented as three year-long modules, starting in the second year of the undergraduate B.Pharm. programme (Figure 1).

The application of pharmacological concepts to patient care is introduced during the second and third year pharmacology practical sessions in the form of simulated clinical case-based scenarios. Experiential learning in the hospital setting occurs in the final year, where the focus shifts to Clinical Therapeutics (Pharmacology4) and the fourth year students complete a 15 week, 180 hour clinical placement in local public sector hospitals. Students spend three mornings a week (three hours a day) in the clinical environment and rotate every two weeks through hospital departments such as Pharmacy, Internal Medicine, General and Orthopaedic Surgery, Obstetrics and Gynaecology, Psychiatry, Paediatrics, Oncology and Renal. Various structured clinical tasks and activities must be completed by the end of each two-week rotation (Table I).

The Pharmacology4 learning outcomes state that students are required to apply discipline-specific knowledge gained in second and third year in order to identify and resolve medicine-related problems encountered in the clinical setting. However, the final year pharmacy students have been observed to experience difficulty in the application and integration of pharmacological knowledge in the clinical environment.

**Table I: Clinical activities in the hospital-based ELP**

Clinical activity	Purpose and description of activity
Ward round	Ideally, the students join the medical doctors on the ward round. On the days when there is no ward round, the students move from patient to patient, reviewing the medical records.
Screening of patient files.	This is a daily function and focuses the student on the medication prescribed, the diagnosis and co-morbid conditions. The intention is to familiarise students with commonly prescribed medications and doses for specific conditions. This activity also provides an overview of the patients in the ward so that the group can then identify a suitable patient case to follow-up on for their detailed patient case review.
Pharmacist intervention	When screening patient files, students may identify medication-related problems. Students then liaise with their hospital coordinator (Nelson Mandela University Pharmacy Department staff member), before discussing the problem with the appropriate staff member at the hospital, who makes the ultimate decision to change therapy. The Nelson Mandela University students are not directly involved in patient care but can discuss medication-related issues with the patient’s medical doctor, hospital pharmacist or nursing staff, in order to optimise patient care. Students are encouraged to conduct medication reconciliations and take a patient history and counsel patients on the correct use of their medication.
Patient case reviews	A weekly written patient case review is completed, using the SOAP* approach for the detailed write-up. These case write-ups (known as SOAP’s) are assessed by the academic staff at Nelson Mandela University. Cases are identified for presentation to the whole class at the Friday report-back sessions. These case write-ups require integration of clinical information in order to understand and optimise the patient care.
Drug information	Drug information is provided on request to medical, pharmacy and nursing staff
Pharmacist directed tasks	Students participate in site-specific activities which are identified by the hospital pharmacists. These activities may include compounding and manufacturing in the dispensary, conducting an audit of the ward stock to check for expired medication, preparation of patient counselling pamphlets or preparing an educational presentation for nursing staff or patients.

\*SOAP: Subjective, Objective, Assessment, Plan. The SOAP approach is a structured and standardised approach to clinical notes, evaluating subjective and objective information in order to make an assessment and plan of action.

This paper will therefore focus on the final year Nelson Mandela University pharmacy students lived experiences in a hospital-based ELP and will present the emergent themes arising from the student expectations, perceived level of preparedness and concerns prior to commencing the ELP, difficulties experienced in the clinical environment, and student perception of their ability to apply knowledge for improved patient care.

## Methods

A qualitative descriptive research design was employed, using focus groups for data collection over two consecutive academic years. Focus groups are recognised as an appropriate data collection technique for the study of attitudes and experiences (Kitzinger, 1995) and have also been used when evaluating how well a programme is working (Williams & Katz, 2001; Krueger & Casey, 2002). Focus groups in health sciences research often involve groups of individuals who share a common identity and goals (*i.e.* pharmacy students), as well as some common 'concrete' or real-life situation (in this case, the hospital-based ELP) (Stewart & Shamdasani, 2015).

Data was collected prior to the commencement of, and again on completion of the ELP. Non-probability purposive sampling was employed with participants recruited via a general email sent to all students registered for the Pharmacology4 module (Year 1: n=73, Year 2: n=106). The email invited students to voluntarily participate in a group discussion on a specific topic (the hospital-based ELP) and provided the time, date and venue. This sampling method encouraged self-sampling by the student population and ensured that participation was voluntary as well as allowing participants to be recruited independently of each other in order to encourage heterogeneity within each focus group (Fern, 2001). All participants consented to participate in the research and provided signed written informed consent. Ethical approval for the research was granted by the relevant university ethics committee.

The method of conducting the four focus groups followed the same approach each time, using recommendations made by several researchers (Kitzinger, 1995; Beyea & Nicoll, 2000; Krueger & Casey, 2002). While it is generally accepted that the size of focus groups should be limited to six to eight participants (Kitzinger 1995; Krueger & Casey 2009), a slightly larger group is preferable to under-recruitment and unsatisfactory data arising from incomplete or limited discussions (Stewart & Shamdasani, 2015). The latter authors reported that focus groups could work well with as few as three and as many as 14 participants. The venue was on campus, in a room that participants were familiar with. Refreshments were available on arrival at the venue, which put the participants at ease and created a relaxed environment (Beyea & Nicoll, 2000). The group was seated around an oval table, ensuring good eye contact with each other and the facilitator.

For experiential discussions, the facilitator should be someone who can relate to students, with insight into the experiences under discussion (Krueger, 1988). The researcher was the module coordinator and, therefore, took the role of the facilitator in order to keep the discussion focused on the specific topic and to facilitate free talk. Five pre-defined questions were used to direct the discussions, although additional questions that arose during the sessions were used to clarify or explore an issue further. The questions were based on the

researcher's observation that students experienced difficulties in the transition from learning in a lecture-based environment to the clinical setting, where knowledge now needed to be applied. Prior to the current research, difficulties had been repeatedly verbalised by students during the ELP. Table II presents the questions used to initiate discussion during the focus group sessions.

**Table II: Questions guiding the focus groups which were held prior to and on completion of the ELP**

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<i>Prior to commencing the ELP</i>	
	What expectations do you have of the hospital-based ELP?
	Do you have any concerns about the ELP?
<i>On completion of the ELP</i>	
	What aspects of the ELP did you find difficult?
	How well prepared did you feel for the application of your knowledge?
	What clinical activities do you feel encouraged or enhanced your learning?

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Every session was audio-recorded for transcription purposes. Anonymity was ensured as each participant was identified numerically (*e.g.* Participant P5) in the transcription. A research assistant noted the order of the discussion as well as the key points. The duration time of the focus groups varied from 40 minutes to two hours 19 minutes, which was in line with recommendations of one to two hours (Rabiee, 2004).

The audio recordings were transcribed *verbatim* and subsequently verified by the researcher and a second independent research assistant (from a non-pharmacy background), by checking the transcripts against the audio recordings for consistency and accuracy as a measure of reliability (Fern, 2001). The transcripts were first read repeatedly before thematic coding of the data, supported by Atlas.ti® software. Recurrent and dominant themes were identified through a process of inductive reasoning. To minimise bias, the researcher and research assistant discussed the coding and themes in order to reach consensus.

## Results

The demographic information of the focus group participants from the two consecutive academic years is shown in Table III.

**Table III: Demographic characteristics of the participants and the duration of the focus group sessions**

	Pre-ELP		Post-ELP	
	Year 1 (Y1)	Year 2 (Y2)	Year 1 (Y1)	Year 2 (Y2)
Number of participants	6	8	10	9
Gender				
Male	2	4	6	1
Female	4	4	4	8
Duration of focus groups	0 hours 40 mins	2 hrs 20 mins	1 hour 41 mins	1 hour 24 mins

Pre-ELP: Pre-experiential learning programme

Post-ELP: Post-experiential learning programme

The results will be reported according to the emerging themes that were identified during analysis (Table IV). As each theme is explored, the results will be presented from the pre-ELP data as well as from the students' retrospective reflections on completion of the ELP (post-ELP). All direct quotations from the transcripts are presented in italicised font, and the participants are identified using the participant number (e.g. P4), the year (Y1 or Y2) and the timing of the focus group in relation to the ELP (pre-ELP or post-ELP).

**Table IV: Themes identified during analysis of the focus group transcripts**

<i>Clinical environment</i>
<i>Inter-professional relationships and professional identity</i>
<i>Integration of knowledge and application to patient care</i>
<i>Self-perceived level of preparedness</i>

**Clinical (Hospital) Environment**

The expectations of the students prior to commencing the hospital-based ELP were found to be realistic and positive in that students expressed interest in the exposure to hospital pharmacy as a future career option. Students looked forward to the opportunity to apply their knowledge in the patient-centred setting of a hospital but also expressed anxiety at the responsibility that comes with patient involvement.

*The hospital programme will provide us with an opportunity to pull everything together and look at a holistic approach to the pharmacological management of the individual (P2:Y2: Pre-ELP)*

*To be able to learn a lot more and gain experience - being able to apply what we've learnt to what we actually have to do (P5:Y1: Pre-ELP)*

*Moving from listening to my lecturer and actually making decisions ... so I think it's just moving from the fact that we were babied in class and now we have to be independent individuals. I think it's going to be quite daunting (P1:Y1: Pre-ELP)*

When reflecting on the ELP on completion of the 15-week programme, the majority of students described feeling overwhelmed by the amount of clinical information in the medical file, admitting that they did not know where or how to start working through this information and how to integrate the clinical notes, prescribed medication and laboratory tests. In addition, many expressed frustration as they struggled to read the doctors' handwriting as well as the frequent use of medical abbreviations which were often context-specific, making interpretation difficult. There was a genuine fear of making a mistake by overlooking important information in the clinical notes:

*The biggest challenge when I started, was how to find information in the patient file, because it was so large and there were a lot of things in there ... most of the times, reading the doctors' handwriting was actually a challenge (P5:Y1: Post-ELP)*

*Having to learn the skills that are applicable in the hospital setting in terms of having to learn how to read the doctors' writing and not make mistakes and in terms of having to know exactly when there is a drug interaction (P6:Y1:Pre-ELP)*

*I have been working [in community pharmacy] since second year and I feel very confident. I feel confident when I'm talking to patients and even when I'm standing in front of the doctor that's coming in for medication but I just felt very overwhelmed with the [hospital] environment (P3:Y1:Post-ELP)*

Pharmacists typically tend to be organised and work in a well-structured environment and several students described how they found the move to an unfamiliar, less structured and at times chaotic or noisy environment, overwhelming and unsettling:

*In class, everything is organised. I'm an organised person. At work, you've got your script, you store it on the computer; you put it in a file and it is filed later on. Everything has its book, everything has its file and then you come to the hospital and everything is in one file and the doctors are running around and the nurses are running around ... so it's not organised the way we are used to (P3:Y2:Pre-ELP)*

On completion of the ELP, participants realised that their ability to integrate all the relevant clinical information in a meaningful manner had definitely improved with time



and repeated exposure, as they became more familiar with the hospital environment and structure of the medical files:

*You typically go straight to the blue chart [prescription medicine] but if you actually go through the doctors' notes, and you read them according to the day, you can see this drug was started on this day and you look at the previous day's notes and you can actually see a reason as to why - it just makes so much more sense (P2:Y2: Post-ELP)*

Several students voiced their initial anxiety and nervousness at having to approach the patient but went on to describe how their confidence developed with repeated exposure to this activity:

*I was a bit worried about the language barrier in terms of communicating with the patients. I wasn't confident in that area (P8:Y1: Post-ELP)*

*I think some people [students] are quite apprehensive on how to approach a patient. We had a lady who pulled the blanket over her head and she didn't want to speak to anyone. There might be a language barrier, they might just not want to speak to you. You walk into that ward and you stand there and, everyone's looking at you, and you're like, where do I go? Who do I talk to? How do I do this? (P1:Y2: Post-ELP)*

*When we stand in retail, they [the patients] come up to us. They come and tell us their problems, we don't have to delve into what's going on, so it's much easier (P1:Y2: Pre-ELP)*

### **Inter-professional relationships and professional identity**

Before the ELP commenced, the majority of students expressed anticipation and interest in working with other healthcare professionals, identifying nurses and medical doctors as healthcare professionals that they looked forward to interacting with for the first time.

*I'm looking forward to working with the other healthcare professionals because in the [community] pharmacy, you are mostly focused on working with the pharmacist or assistant and, if you're lucky, there's a nurse, so I'm really looking forward to working with the doctors and nurses and physiotherapists (P6:Y1:Pre-ELP)*

Several students found that the reality of entering an unfamiliar clinical environment proved to be more difficult than expected.

*You need to get familiar with your surroundings. So that's the scariest part, going into it [the ward], because you're nervous now, and the [nursing] sisters are looking at you. What are they going to think if I say something to them? (P1:Y2: Post-ELP)*

*I wasn't sure if the nurses or the staff would be too receptive of my concerns and questions, so at times I would hold back and I would not ask questions (P1:Y1:Post-ELP)*

*On our very first ward round, we were encouraged to ask questions and then I asked the doctor about an antibiotic and he completely took my head off. So I think that was a bit of a strike to the confidence. You're very hesitant to ask questions after that (P2:Y1: Post-ELP)*

The majority of students expressed a fear of questioning a doctor's clinical decision regarding medication-related issues. The doctor was seen as the ultimate authoritative figure who should not to be questioned.

*In first year, second year, third year and fourth year, I meet my lecturers and they are so knowledgeable, so now when I go into the hospital, I see a doctor and somehow I just link the doctor to my lecturer. So I've never in the past three years told a lecturer that they've made a mistake, so it's always been this submission thing that's been there, and all of a sudden I have to jump out of this shell (P10:Y1:Post-ELP)*

*The one thing which I find a bit difficult ... was to speak up and try and question the doctor, because I'm used to the lecture environment where I get given the work, I study and then I write the test. I've got no right or place to question what he is doing [the medical doctor] (P7:Y2: Pre-ELP)*

Several students added that they found it much easier to interact with the medical interns than the more senior doctors.

*It was a lot easier for us to approach the interns, because the interns were more or less our age ... Once you speak to a couple of doctors, you find out they actually want you there, they want you to help, they want you to pick up interventions, because it also benefits them (P4:Y1:Post-ELP).*

A lengthy discussion revolved around the role of the pharmacist in the clinical setting. A feeling of inferiority and a lack of confidence was expressed and discussed at length, with participants identifying a perceived lack of knowledge, possibly stemming from a poor professional identity for the role of the pharmacist in the clinical setting of the hospital environment.

*Sometimes I feel as though the pharmacy profession is not taken into consideration because a lot of people think that we just dispense drugs (P6:Y1: Pre-ELP)*

*He [the doctor] has seen the whole view of the patient and I am just looking at the drug side effects, so I feel that my knowledge, is in comparison, very*

*minute to what he does, so I can immediately put him up there and then I'm like, can I really question him?* (P7:Y2: Pre-ELP)

*I've been called a glorified pill counter ... that lady from the Nursing Department called us medication specialists and that made me feel a little less inferior, because we do know the medication. The doctors know the diagnosis and some medications and the nurses know the caring. Everybody should work together, you know your field, you specialise in your field and you should all work together* (P3:Y2: Pre-ELP)

One participant disagreed vehemently with the group and proudly shared her feeling of confidence in her ability. She was a mature student in terms of age and had worked in a pharmacy environment before coming back to study. Her self-confidence and strong professional identity was in stark contrast to the rest of the participants:

*I don't feel inferior at all. Not at all. I have studied medicines for four years, I am a specialist in the field of medicines and I'm so confident about that. I have been taught at Nelson Mandela University and I am not ashamed of anything* (P5:Y2: Pre-ELP)

The observed insecurity about the pharmacist's role diminished as the students' clinical skills improved and they became more familiar with the environment.

*The doctors asked us about a patient who had a problem with her warfarin ... she was on 10 mg a day, and her INR was still under 2 and he asked us, is there an interaction going on between these drugs? So ... there was a possible interaction, but there's nothing you can really do about it. You just have to increase her dose. That makes you feel so useful in the ward, he [the doctor] was like, pharmacists you know this and he asked us and it was really rewarding to have that* (P1:Y2: Post-ELP)

### **Integration of knowledge and application to patient care**

Before the start of the ELP, the participants described a general lack of confidence in their level of pharmacology knowledge and their ability to verbalise and apply this knowledge.

*In class, if you study something, you have time to recall what you want to know ... but now in the hospital, you've got to think on your feet. If somebody asks you something, you must be able to answer. If you get a drug class wrong, that's a problem* (P3:Y2: Pre-ELP)

*The most frightening thing is the fear of making a mistake ... knowing when you are making the right decision or the wrong decision* (P2:Y1: Pre-ELP)

This lack of confidence appeared to stem from a feeling that students lacked integration of their knowledge.

Several students also felt that the written assessments in Pharmacology<sup>2</sup> and Pharmacology<sup>3</sup> were not integrated, which negatively affected their ability to integrate their pharmacology when learning:

*Often we learn topics in isolation and we forget to link everything together ... I think the main problem is trying to realise that pharmacology cannot be studied in isolation but needs to be integrated* (P2:Y1: Pre-ELP)

*When we start doing pharmacology in second year we are taught things as topic per topic and that somehow trains you to think separately ... you grow to think that way, like okay, this is antibiotics, this is antidepressants, and, then you come to fourth year and you have to put everything together, so now you also have to learn how to integrate everything in such a short time* (P8:Y1: Post-ELP)

*I think it would be nice to integrate questions more from different sections, because I think it also wakes people up that you can't study pain by itself* (P1:Y2: Pre-ELP)

Several students described a lack of confidence in their ability to identify medication-related problems as they struggled with the apparent conflict between what they had been taught in lectures and how patients were actually managed in practice.

*Warfarin and aspirin, those shouldn't go together, but then you get a case and the doctor says no, they have shown how beneficial that is. So it's also drug interactions and you get CYP450 inhibitors that you think, oh no, don't put those two together, but they [the medical doctors] like to put those together, so it doesn't always match up* (P9:Y2: Post-ELP)

*For me it was when I went to the hospital, I just consulted my TB [tuberculosis] guidelines and I thought everything had to be done according to that, so we got to see a patient with TB meningitis, so then the doctor says no, that's just a recommendation* (P5:Y1: Post-ELP)

However, when reflecting on their ability to integrate and apply knowledge while looking for medicine-related problems in the clinical setting, the participants were able to identify how this clinical skill developed and improved with time as they grew in confidence and became familiar with the new environment. This really reinforced the need in ELPs for repeated exposure which encourages learning by repetition.

*As the programme went on, you became so accustomed to the files, to the patients, to the drugs, that you just pick it up so much more quickly than you were in the beginning. You actually realise the importance of having to do it, because you start finding interventions that are really beneficial to the patient, where the doses might be wrong or they are using the wrong drug* (P4:Y1: Post-ELP)

*You're in the ward, you're seeing the problems, you're speaking to the doctors about the problem, getting the drug changed, you're fixing issues and now I will never forget ... that drug has a problem with this [drug] and needs to be changed (P2:Y2:Post-ELP)*

On completion of the ELP, two participants described how they found the discussions with medical doctors were a beneficial and positive learning experience, which also appeared to reinforce the pharmacist's role in this clinical setting:

*What really helped me was going on rounds with the doctors, where you have the opportunity to be asked a question. So my first hospital round was bad but then I went home and I started studying for the subsequent ones, so my second hospital round was fabulous because I was able to be on a par with the doctors and I was happy and it really helped me (P9:Y1: Post-ELP)*

*We went on a hospital round at least once a week with the doctor ... so we would meet the doctor and we could introduce ourselves and then we would go patient to patient with the doctor ... it also helped us develop confidence in speaking to the doctor and asking questions (P3:Y1:Post-ELP)*

All the participants confirmed the usefulness of the weekly structured clinical activities and tasks completed during the ELP (Table I) although personal preferences were mentioned. The screening of medical files for medicine-related interventions and detailed patient case reviews were named by the majority of participants as the most useful learning activities.

*With the screenings, you're seeing all those drugs so close together and you get used to linking them and seeing okay, these drugs together, that condition, these drugs together, that is another condition (P2:Y1:Post-ELP)*

*Towards the end, I didn't really have to search for interventions. I realised that the way to find the interventions was that I had to carefully go through the file and then as I did that, then I realised that you would easily find interventions (P5:Y1: Post-ELP)*

*The [patient case review] SOAP definitely helped you put everything together, to make it complete, to close off on a topic and on a disease state, because you have multiple drugs, multiple conditions that you just link and how important it is to monitor your labs [laboratory investigations] (P3:Y1:Post-ELP)*

### **Self-perceived level of preparedness**

At the start of the ELP, the majority of participants felt unprepared and expressed concern that their pharmacology knowledge was inadequate due to a lack of integration of content (as mentioned previously). Most

of the participants identified the simulated clinical case scenarios in second and third year pharmacology practical sessions as useful preparatory exercises.

*I think I learnt better with simulated patient cases than actually just learning from my notes and then having to think of how I would apply this to a patient (P1:Y1:Pre-ELP)*

However, when reflecting on the integration of knowledge that should have accompanied these practical sessions, several students pointed out that this did not always happen, explaining that work was divided between group members in order to complete the practical session quickly.

*For me, it didn't ... in my group, everyone was ... you do side-effects, you do mechanisms, we never got to sit down and discuss the problem. We did not relate the drugs or the case to each other (P1:Y1: Post-ELP)*

The externship hours done in community pharmacy settings were not perceived as adequate preparation for the clinical rotations, with many of the participants expressing frustration with the lack of direct involvement with patient care.

*In the beginning, the pharmacists don't really want to train you and you don't really know how to work on the [computer] system - so all you have to do is count out stock or pack stock ... you are just dispensing drugs but you never really interact with patients or have the opportunity to intervene with patients (P5:Y1:Pre-ELP)*

*When you start counselling someone, they just say no, I know this, just give me the medicines and then they can leave (P2:Y2: Pre-ELP)*

*In community [pharmacy] all you have is the prescription and you don't have the clinical picture, whereas in hospital, you've got the medical file as well as the prescription - and the diagnosis (P4:Y2: Post-ELP)*

However, the externship hours in community pharmacy were seen to provide essential skills such as multi-tasking, task prioritisation and communication.

*I think to be a pharmacist, you need to be able to answer a phone, while speaking to a person, have a screen open here and have someone shouting at you because the queue is long. I think you need to be able to balance a whole lot of things (P1:Y2: Pre-ELP)*

*I think that's what retail [community pharmacy] taught me. To be more confident with patients and doctors and other pharmacists (P4:Y1: Pre-ELP)*

*So ... I can just look at the prescription and look at the drugs and link it to what's wrong with the patient.*



*Also the idea of paying attention to detail, because if a customer comes in and you are standing there, you have a limited time frame to get the patient details and you have to pay attention to the details (P6:Y2:Pre-ELP)*

## Discussion

In South Africa, experiential learning opportunities in the community pharmacy setting are well established and at the Nelson Mandela University, are introduced from the second year level of undergraduate pharmacy training. By final year, the undergraduate pharmacy student has established a clear professional identity for the community pharmacist.

In contrast, the lack of clinical pharmacists in South African public sector hospitals was found to complicate the introductory exposure of undergraduate pharmacy students to the hospital setting as the role of the pharmacist as a member of the clinical team was not well established. During the ELP, the Nelson Mandela University pharmacy students were placed with medical doctors and nursing staff in the absence of a pharmacist as the preferred role model. Although four pharmacists were employed by the University to accompany the students as clinical placement coordinators for the ELP, the coordinator to student ratio was far from ideal at approximately 1:25, resulting in students spending much of their time in the wards in the company of healthcare professionals other than pharmacists. Thus the research presented here suggests that South African pharmacy students lack a professional identity for the clinical role of the hospital pharmacist. One participant even identified the need for a role model: *“let them [the clinical placement coordinators] do the work, let them screen the file, let them talk to the patient, let them talk to the doctor, let them talk to the nurse ... so I could see how things are done”* (P3:Y2: Post-ELP). The focus group participants described a feeling of inferiority and being overwhelmed when first entering the clinical environment, as they compared their knowledge to that of the medical doctors and found themselves lacking. Hughes and McCann (2003) previously identified this feeling of subordination as an inter-professional barrier between community pharmacists and general practitioners in the primary care setting in Ireland.

Thus in the South African healthcare setting, revisions to the undergraduate pharmacy curricula have embraced the clinical, patient-centred role of the pharmacist, but in many areas of practice, the workplace lacks clinically-orientated pharmacy practitioners. Despite this, the pharmacy students developed a better insight into the role of the pharmacist in the healthcare team on completion of the hospital-based ELP. Inter-professional discussions were seen to contribute to improved student confidence and a deeper understanding of the clinical management of the patient.

Students found that as the ELP progressed and the daily clinical activities in the ward were repeated on a daily

basis, students were able to integrate the clinical information and identify medicine-related issues and possible pharmacist interventions to follow up on. Keijsers *et al.* (2014) found that pharmacy students in the Netherlands had a better basic knowledge of pharmacology compared to medical students who had better prescribing skills but there was little difference in applied knowledge between the two student groups, suggesting that the clinical application of pharmacological knowledge comes with clinical practice experience. Context learning coupled with repeated exposure to patient cases has been described as essential components for the development of clinical and therapeutic reasoning skills in medical students (Richir, Tichelaar, Geijteman & de Vries, 2008; Bissessur *et al.*, 2009; Tichelaar *et al.*, 2015).

Frustration was also expressed at the start of the ELP, as some students felt they were too focused on completion of the clinical activities and needed more time in the clinical setting. This feeling of an overly structured ELP can limit learning and relationship building initially as students grapple with the new environment and task completion (Owen & Stupans, 2009).

An unexpected finding of the present research was the general feeling of the students that experiential learning in the community pharmacy setting did not prepare them for the hospital-based clinical placements. This appears to be due to a lack of involvement in direct patient care, with students describing experiences limited to the technical function of dispensing the prescription, with little if any opportunity for patient counselling. Surprisingly, the community pharmacy setting was not seen as an environment where students would use their pharmacological knowledge, as one student explained: *“I feel like it is more about applying the pharmacy practice knowledge when you are in retail than applying your pharmacological knowledge”* (P1:Y1:Pre-ELP). The lack of confidence in working with patients was also demonstrated by the initial hesitancy in approaching and interacting with patients in the ward. In addition, the community pharmacy setting appeared to discourage rather than facilitate interactive communication with medical doctors, so that students entered the hospital setting with negative perceptions and feelings of inadequacy. As mentioned by Horsburgh, Lamdin and Williamson (2001), the timing of learning about different professional roles is not clear in the literature but it was of concern that these final year pharmacy students had already developed perceptions and attitudes which impacted negatively on their professional identity at this early stage.

Another notable finding was the initial perception that the doctor's clinical decision regarding prescribed medication should not be questioned by a final year pharmacy student. The ease with which students initiated inter-professional discussions about a patient's medication appeared to improve with time as the students became more familiar with their role in this setting, supporting the need for more inter-professional interaction during undergraduate pharmacy training.

Finally, the initial concern about a lack of preparedness and lack of confidence in their ability to apply their knowledge appeared to improve as students started to integrate the clinical information, and link the condition to the medication prescribed, gaining insight into the rationale for the choice of medication prescribed. The feeling of unpreparedness may also have been a result of student apathy towards the series of introductory lectures and the manual provided for the clinical placements which details tasks and clinical activities to be performed. This lack of pre-placement preparation has previously been reported with M.Pharm. students in the UK (Nation & Rutter, 2011).

### Limitations

The recruitment method which used a general email to all final year pharmacy students registered for the Pharmacology4 module may have resulted in participation bias. However, observations by the researcher noted that the respondents were a diverse group in terms of gender, race, academic ability and pharmacy work experience and therefore provided a good representation of the final year pharmacy student population. All four focus group sessions were characterised by lively discussion and debate. This was particularly evident in the Pre-ELP Y2 group, as seen by the extended duration of the discussions.

### Conclusion

In summary, the introductory hospital-based ELP was found to be a worthwhile learning experience with participants in agreement that integration of pharmacology improved, as the following participant explained, “*the hospital rounds helped a lot to apply your drug knowledge*” (P5:Y2:Post-ELP). Many participants felt an initial introduction to the hospital environment could occur earlier in the B.Pharm. programme, expressing a desire to merely observe a ward-round, and gain familiarity with the medical charts. Evidence in the literature is starting to support early rather than later clinical placements (Ackman & Mysak, 2009; Williams, Brown, & Etherington, 2013). The value of experiential learning was described by participant 3 when reflecting on the ELP, “*you don't realise through this experiential [programme] that you actually really learn*” (P3:Y2:Post-ELP). Reflection is an invaluable component of experiential learning (Kolb & Kolb, 2005). In this ELP, reflection occurred on completion of the ELP at the end of the academic year when students submitted a portfolio of clinical evidence. Learning may have been enhanced if reflection occurred on completion of each two week clinical placement rotation.

One of the underlying concerns from a pharmacy educator viewpoint was the lack of clinical pharmacists to accompany the students in the wards. Although this concern was substantiated by the students' comments, the required learning objectives of the ELP were still met and the students identified the role of pharmacists in

contributing to direct patient care. The positive impact of interacting with different healthcare professionals was realised although difficulties were experienced initially. We believe this research, for the first time, reports on students' lived experiences in the South African hospital setting and as such, may have highlighted areas for improvement, not only for South African pharmacy educators but also for other developing countries with a lack of clinical preceptors, shortage of pharmacists and an under-resourced healthcare setting with high patient burdens.

As pharmacy educators worldwide move towards increasing the experiential learning components of the undergraduate pharmacy curricula, the current research provides important points to be considered when planning and extending the ELP. As one participant summed up:

*The hospital programme [ELP] ... it's amazing, you learn, you revise, you integrate ... it's just a good balance of everything you need to do in pharmacy as a career. The decision making thing is great because as a pharmacist, you have to make a decision, instead of just knowing, there's a side-effect, that's an interaction. I think knowing the interaction and what you would do, finishes it and prepares us* (P4:Y1:Post-ELP)

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