

## INTEGRATION OF EARLY COMMUNITY PRACTICE IN PHARMACY EDUCATION AT THE UNIVERSITY OF BELIZE

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Received 20 June 2021; Revised 22 June. 2021; Accepted 19 July 2021, Available online 10 Oct. 2021



Cite this article as: Husaini DC, Abubakar Y, Thurton LH, Mphuthi DD and Chiroma JA. Integration of Early Community Practice in Pharmacy Education at the University of Belize. Asian Journal of Pharmaceutical Education and Research. 2021; 10(4): 27-40.

<https://dx.doi.org/10.38164/AJPER/10.4.2021.27-40>

### ABSTRACT

Recently, the University of Belize pharmacy program implemented a 5-year bachelor of pharmacy degree to meet the national and regional demands for pharmacists. This study was designed to provide students with early pharmacy practice experience aimed at integrating the knowledge and skills needed to practice as future pharmacists. Data collected for the program shall be used for the program review at the end of the first cycle of the bachelor's degree training. Quantitative and qualitative methods of data collection were employed to assess credit-bearing experiential learning activities in two consecutive semesters at community pharmacies in Belize. Data were collected utilizing reflective essays, self-assessment questions, and focus groups. Analyzed data were described, presented in tables, and emerged themes were discussed. Students reported a robust learning experience as a result of the experiential activity. They reported integrating theory to practice in pharmacology, improved communication, dispensing OTC and prescription drugs under a supervisor, patient counseling, and build confidence and inter-professional relationship with preceptors. Experiential learning activities in the community pharmacy settings are not well established in Belize. Providing regular experiential learning opportunities early in the bachelor's program will enhance students' experience, build students' confidence, and improve the quality of the University of Belize graduates. In general, the students expressed that the experience was enriching and should be continued.

**Keywords:** Pharmacy education, pharmacy practice, community pharmacy, experiential learning, pedagogy, University of Belize.

## INTRODUCTION

The role of the pharmacist in the millennial healthcare system has evolved to involve both clinical and research development. For instance, some crucial engagements by pharmacists included prevention of ill health and health promotion; influencing rational prescription and medication usage; self-care; supply and use of prescribed drugs and other health care products.<sup>1-2</sup> In providing solutions to drug-related issues, the integration of both theoretical and experiential learning has characterized the training of pharmacists globally thereby providing the students with the pre-requisite knowledge and skills needed to practice as efficient pharmacists. Pharmacy education in Belize has transitioned from apprenticeship training in the 1950s to a diploma program (1980's), to a formal Associate degree program (1990's), to the now Bachelor of Pharmacy (BPharm) program at the University of Belize, which commenced in 2018. Recognizing that the associate degree level of certification was an anomaly for a professional program initially prompted the change to the bachelor degree, and bolstered by regional recommendations from The Pan American Conference on Pharmaceutical Education, which recognizes the bachelor's degree as the entry-level for practice.<sup>3</sup>

Utilizing the Proposal for a Basic Plan for Pharmaceutical Education and Pharmacists' Competencies for Professional Practice as a guide in developing the University of Belize pharmacy curriculum, the primary objective of the program is to produce pharmacists who are equipped to provide safe and effective pharmaceutical services, on par with regional and international standards of practice.<sup>3</sup> The program aims to train pharmacists who are competent in (1) delivering effective pharmaceutical care, (2) providing health education from a public health perspective, (3) resource management, and (4) communication.<sup>3</sup> The Bachelors of pharmacy program is undergoing careful implementation and monitoring to ensure the training meets the set objectives. Part of the implementation process is to explore different pedagogical strategies appropriate to current pharmacy practice and in the delivery of healthcare.

The B. Pharm program currently has incorporated three segments of experiential learning in the 4<sup>th</sup> and 5<sup>th</sup> years of the training. In the fourth year, successful students in core professional classes shall be required to do a 144-clock hours' therapeutics rounds at a tertiary health care institution. In the 5<sup>th</sup> year, the program was designed to provide the students with an entire year of clinical clerkship with major rotations in hospitals, community pharmacy, compounding & manufacturing, and marketing & distribution (Table 1). By this design, students will have their first clinical pharmacy experience at the end of the 4<sup>th</sup> year of training. Late exposure to clinical pharmacy practice is a common curriculum design in many pharmacy schools globally, where most of the early training requires students to gain sufficient theoretical knowledge in the basic and pharmaceutical sciences.

**Table 1. BACHELOR OF PHARMACY  
Program Sequence<sup>1</sup>**

<b>Health Sciences Prepara tory Courses</b>	<b>YEAR 1</b>				
	<b>Semester 1</b>				
	Course Code	Course Name	Credit	Prerequisite	Co requisite
	ENGL1014	College English I	3		
	CHEM1015	General Chemistry I	3		CHEM1015L
	CHEM1015L	General Chemistry I lab	1		CHEM1015
	BIOL1015	General Biology I	3		BIOL1015L
	BIOL1015L	General Biology I lab	1		BIOL1015
	MATH1014	College Algebra	3		
	PHIL1014	Ethics	3		
		<b>17 credits</b>			
<b>Semester 2</b>					
ENGL1025	College English II	3	ENGL1014		
CHEM1025	General Chemistry II	3	CHEM1015	CHEM1025L	
CHEM1025	General Chemistry II lab	1	CHEM1015L	CHEM1025	
BIOL1025	General Biology II	3	BIOL1015	BIOL1025L	
BIOL1025	General Biology II lab	1	BIOL1015L	BIOL1025	
SPAN1015	Spanish level 1	3			
<b>*If required</b> HIST1014	History	3			
		<b>17 credits</b>			
<b>YEAR 2</b>					
<b>Semester 1</b>					
ALHL2012	Human Anatomy and Physiology I	3	BIOL1015;BIOL1015L CHEM1015,CHEM1015L		
MATH1045	Pre-Calculus	3	MATH1014		
ENGL3155	Technical Writing	3	ENGL1025		
BIOL3402	General Microbiology	3	BIOL1015	BIOL3402L	
BIOL3402L	General Microbiology Lab	1		BIOL3402	
PSYC1014/ SOCL1014	Psychology or Sociology	3			
		<b>16 credits</b>			
<b>Semester 2</b>					
ALHL2021	Human Anatomy and Physiology II	3	ALHL2012		
RSCH2014	Research Methods	3			
ALHL1024 or ALHL2904	Health education course	3			
SPAN1025	Spanish level 2	3			
<b>*If required</b> CHEM1032	Introduction to Organic and Bio chemistry	3			

<sup>1</sup> Updated March 2021. This sequence is for students entering August 2021

	<b>MGMT1014</b>	<b>Fundamentals of Management</b>	<b>3</b>		
	<b>TOTAL</b>			<b>18 credits</b>	
				<b>68 credits</b>	
<b>Professional Core (BPHA)</b>					
<b>YEAR 3</b>					
<b>Semester 1</b>					
<b>Course Code</b>		<b>Course Name</b>	<b>Credit</b>	<b>Prerequisite</b>	<b>Co requisite</b>
<b>BPHA3051</b>		<b>Introduction to Pharmaceutical science</b>	<b>3</b>	<b>BIOL1025; CHEM1025</b>	<b>BPHA3101</b>
<b>BPHA3101</b>		<b>Pharmacy Calculations</b>	<b>3</b>	<b>MATH1014</b>	<b>BPHA3051</b>
<b>BPHA3151</b>		<b>Pharmaceutical Microbiology</b>	<b>3</b>	<b>BIOL1025</b>	
<b>SPAN2015</b>		<b>Spanish Level 3</b>	<b>3</b>		
<b>ALHL2905</b>		<b>Biostatistics for Health Professionals</b>	<b>3</b>	<b>MATH1014</b>	
<b>BIOL1201</b>		<b>Biochemistry</b>	<b>3</b>		
			<b>18 credits</b>		
<b>Semester 2</b>					
<b>BPHA3202</b>		<b>Pharmacology 1</b>	<b>3</b>	<b>ALHL2021;</b>	<b>BPHA3252</b>
<b>BPHA3252</b>		<b>Pharmaceutics</b>	<b>3</b>	<b>BPHA3101; MATH1045</b>	<b>BPHA3202</b>
<b>BPHA3302</b>		<b>Pharmacognosy</b>	<b>3</b>	<b>CHEM 1032; PHAR3151</b>	
<b>BPHA3352</b>		<b>Pharmaceutical Chemistry</b>	<b>3</b>	<b>CHEM1025; CHEM 1032; BIOL1201</b>	<b>BPHA3302</b>
<b>ALHL3012</b>		<b>Pathology of Human Diseases</b>	<b>3</b>	<b>ALHL2021; BPHA3151;BIOL1201</b>	
<b>ALHL3904</b>		<b>Research Methods for Health Professionals</b>	<b>2</b>	<b>ENGL1035 RSCH2014</b>	
			<b>17 credits</b>		
<b>Total</b>			<b>35 credits</b>		
<b>Professional Core (BPHA)</b>					
<b>YEAR 4</b>					
<b>Semester 1</b>					
<b>BPHA4051</b>		<b>Therapeutics I</b>	<b>3</b>	<b>BPHA3202; ALHL3012</b>	
<b>BPHA4101</b>		<b>Pharmacology II</b>	<b>3</b>	<b>BPHA3202</b>	
<b>BPHA4151</b>		<b>Dispensing I</b>	<b>2</b>	<b>BPHA3101</b>	<b>BPHA4151L</b>
<b>BPHA4151L</b>		<b>Dispensing I Lab</b>	<b>1</b>		<b>BPHA4151</b>
<b>BPHA4201</b>		<b>Pharmacy Law and Ethics</b>	<b>2</b>	<b>BPHA3202;PHIL1014</b>	
<b>BPHA4251</b>		<b>Pharmacokinetics</b>	<b>3</b>	<b>BPHA3202;BPHA325 2; MATH1045</b>	
<b>BPHA4301</b>		<b>Patient Counseling and Physical Assessment</b>	<b>3</b>	<b>BPHA3202; ENGL1025</b>	<b>BPHA4051; BHAR4101</b>
			<b>17credits</b>		
<b>Semester 2</b>					

BPHA4352	Therapeutics II	3	BPHA4051; BPHA4101 BPHA4151	
BPHA4402	Pharmacy Management	3		
BPHA4452	Pharmacology 3	3	BPHA4101; BPHA4051	
BPHA4502	Dispensing II	2	BPHA4151;BPHA330 2	BPHA4502L
BPHA4502L	Dispensing II Lab	1	BPHA4151L	BPHA4502
BPHA4552	Toxicology	2	BPHA4101; BPHA3302	
BPHA4602	Pharmaceutical Analysis and Quality Control	2	BPHA3352; BPHA3101; BPHA4151	
BPHA4652; BPHA4702; BPHA4752 BPHA4802	Elective (veterinary Pharmacy; Nutrition in Pharmacy; Sterile Technology; Drug Regulatory Affairs	2	Vet Pharmacy-BPHA 4151 Nutrition— BPHA4051;BPHA330 2 Sterile technology— BPHA3252; BPHA3101; BPHA4051; BPHA4301	
		18 credits		
Summer I BPHA4803	Therapeutics Rounds	2	BPHA4452; BPHA4352; BPHA4201; BPHA3302	
Total		37 credits		
<b>Professional Core (BPHA) YEAR 5</b>				
Semester 1 BPHA5991	Supervised Internship 1 <sup>2</sup>	8	All BPHA courses	
		8 credits		
Semester 2 BPHA5992	Supervised Internship II	8	BPHA5991	BPHA5052
BPHA5052	Board Review	2		BPHA5992
		10credits		
Total		18 credits		

<sup>1</sup> Recommend using standard used in the Caribbean to calculate practice/ internship hours: 80 clock hours = 1crhr

This curriculum design, however, even though practiced globally, has its limitations, and presently, the training in many pharmacy schools has moved to a blend of theory, research, and clinical practice-based. The major challenges in clinical education are how to effectively combine classroom-taught theoretical knowledge and clinical experience.<sup>2,4-6</sup> Additionally, since clinical learning experiences are considered highly important in the teaching-learning process of medically-related programs, early exposure to the clinical practice, as well as effective integration of theoretical knowledge will produce pharmacy

graduates that will have better skills and attitudes required to deliver optimum patient care professionally.<sup>4-5,7-8</sup>

To address the issue of late exposure to pharmacy practice, the UB Pharmacy Experiential Learning Project (UBP-ELP1) was introduced.<sup>9</sup> The UBP-EPL1 project seeks to provide early exposure of the students to pharmacy practice. The project was designed to help the students develop skills that are comparable to real-life situations at different points of pharmacy training prior to the curricular-provision of pharmacy practice. The experiential learning activities, in addition to providing accumulative students pharmacy experiences, will also provide evidence-based data for the review of the 5-year bachelor of pharmacy program at the University of Belize.

This study reported the first experiential learning activity incorporated in the third-year of the BPharm program. The credit-bearing activity was designed to help students participate in holistic learning that meets both the student and the community's needs. In addition, the exposure was intended to provide the students with a greater sense of responsibility and a deeper appreciation of the dynamics of pharmacy practice. Finally, the experiential learning activity was aimed at providing data for the program review.

### **Research objectives**

The study objectives were to help students

- Develop skills in listening and responding to patient's needs
- Build experience in the day to day management of the pharmacy
- Expand knowledge in the compositions of commonly requested over-the-counter and proprietary products
- Acquire skill and confidence in making product recommendations

### **METHODS**

#### **Study design and participants:**

The study utilized quantitative and qualitative methods to collect data in two consecutive semesters from the participating students. The credit-bearing experiential learning activities were incorporated in the third-year courses (Introduction to pharmaceutical science and Pharmacology I) of the pharmacy program and experiences gained by the students documented.

Fifteen students enrolled in the third year courses were purposively recruited for the study. Preceding the community pharmacy experiential postings, the theories and concepts outlined in the course's intended learning objectives (ILOs) were taught and extensively reviewed with students. Sites for community pharmacy experience were identified by the lecturers and ILOs discussed and reviewed with preceptors. A checklist of expectations in line with ILOs was finally agreed upon by facilitators, students, and

preceptors before the commencement of the experiential learning. Students were then assigned a minimum of 32-clock hour's experiential learning exposure at any of the approved community pharmacies of their choice in both semesters. The timing for the activity was at the student's convenience even though assigned hours must be completed by the 13<sup>th</sup> week of the semester (each semester was 16 weeks). During the entire period of the experience, facilitators, students, and preceptors reviewed students' integration with the pharmacy practice site while identified areas of misunderstandings were addressed.

### **Data Collection:**

Data were collected from student's reflective experiential reports, focus groups, and an adapted self-assessment questionnaire modified for the study.<sup>10</sup> This approach provided an opportunity for the students, the preceptors, and the course facilitators to give a detailed description of the experience. Data were collected over two consecutive semesters (August to December 2019 [first semester] and January to May 2020 [second semester]).

### **Data Analysis:**

Data were analyzed both quantitatively and qualitatively. Descriptive statistics were used to summarize quantitative data with aid of Statistical Package for Social Sciences (SPSS) version 21. Differences between semesters were evaluated using Wilcoxon rank tests for numerical and ordinal variables. For proportions, Fisher's exact test was used. Tests were two-sided with  $\alpha$ -value of  $<0.05$  considered significant. Focus group interview results were transcribed using Microsoft Excel and loaded into qualitative data analysis (QDA) Miner Lite version 2.0.6 online software for coding. The integrated themes generated were presented in narrative passages and used to summarize study findings.

### **Ethical considerations:**

The study protocol is part of a review for the Bachelors of pharmacy program and faculty work plan of the Allied Health department, Faculty of Health Sciences, University of Belize. The UBP-ELP project and all the processes involved in its implementation were explained to the students and their consent sought before the commencement of the project. Although it was credit-bearing experiential learning, the students had the option not to participate and would have been given another activity in place of the experiential learning. Codes were used for data collection from students and personal identifiers were excluded in most aspects of the study. All the students enrolled in the courses consented to participate in the clinical experiential learning and provided signed informed consent.

## RESULTS

All the students completed the experiential learning exposure in both semesters. The average age of the students was  $24.4 \pm 3.42$  comprised of 11 (68.75%) females and 5 (31.25%) males. Although the students were assigned a minimum of 32-clock hours, most students reported doing more hours than required, with average hours of  $34.3 \pm 5.36$ .

The results from the student's completed self-assessment questionnaire are presented in Table 2. Consistent and positive responses were seen in the overall self-assessment by the students. In addition, improvement in student performances was seen from the first posting to the second posting in all the self-assessment items.

**Table 2. Students Self-Assessment Questionnaire**

Self-assessment questions		First posting (n=15) Mean score	Second posting (n=15) Mean score	p-value
1	The experience helped me to understand and appreciate the pharmacy practice environment.	$4.3 \pm 0.12$	$4.9 \pm 1.5$	.031
2	The experience helped me to understand and appreciate pharmacy practice.	$4.4 \pm 1.06$	$4.8 \pm 1.7$	.002
3	I had the opportunity to learn and assist in the responsibilities and services of the pharmacist.	$3.7 \pm 2.02$	$4.9 \pm 1.9$	.081
4	I had the opportunity to assist in attending to or assessing customer's (clients) needs.	$2.8 \pm 1.2$	$4.2 \pm 0.9$	.004
5	Practicing in the pharmacy helped to reinforce theoretical instructions on OTC products and dosing.	$2.6 \pm 0.9$	$4.2 \pm 1.1$	.015
6	Practicing in the pharmacy helped to reinforce theoretical instructions such as names and classes of medications.	$2.5 \pm 1.7$	$4.3 \pm 1.9$	.001
7	Practicing in the pharmacy helped to reinforce theoretical class instructions such as types of dosage forms, calculations, prescription medications, legal labeling, and storage requirements.	$2.0 \pm 1.3$	$4.1 \pm 2.4$	.004
8	Practicing in the pharmacy helped to reinforce theoretical coursework such as patient information on OTC and prescribed products.	$3.0 \pm 0.8$	$4.6 \pm 1.6$	.016
9	I had the opportunity to be involved with/observe non-pharmacy aspects of the volunteer	$4.0 \pm 1.8$	$4.8 \pm 2.1$	.007
10	I felt comfortable with the tasks that I was assigned	$3.7 \pm 0.9$	$4.8 \pm 2.8$	.024
11	I enjoyed learning from and working with the preceptor	$3.9 \pm 1.2$	$4.5 \pm 1.7$	.006
12	The preceptor treated me like a professional peer and made me feel a part of the team	$3.7 \pm 2.1$	$4.6 \pm 2.2$	.008
13	The objectives helped me to focus my pharmacy experience and get exposure in a variety of areas in pharmacy practice	$4.5 \pm 0.8$	$4.9 \pm 0.8$	.016
14	Overall, the volunteer provided me with a good learning experience	$4.6 \pm 0.6$	$5.0 \pm 0.4$	.003
15	I recommend that the experience should be ongoing	$4.5 \pm 0.9$	$4.8 \pm 0.7$	.005



Responses were based on a Likert scale with 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree. Results are expressed as mean  $\pm$  standard deviation. Statistically significant results between semesters ( $P < 0.5$ ).

### **Analysis of Focus Group and Reflection Essays**

Four major themes identified are Professional interactions, integration of theory to practice, pharmacy skills, and challenges to early community practice. These themes are discussed below.

#### **Theme 1. Professional interactions**

The first theme identified from the analysis of the student's focus group and reflective essays was the student's inter-professional interactions and the pharmacy environment. Several students expressed their experiences on the interactions with the preceptors. In addition, students provided insights that they gained in the pharmacy environment, evidenced by some of their comments below.

*At first, I wasn't sure how the pharmacist will treat me. But the pharmacist was friendly and treated me as a colleague. She was patient in explaining to me the pharmacy environment, where to find the drugs on the counter, and how to professionally respond to the customers. (S7)*

*I know that I have been to the pharmacy a couple of times to buy medications but being in the pharmacy behind the counter completely changed my perspectives about the pharmacy profession. I was introduced to the different sections of the pharmacy and given orientation on how to find the drugs based on the way they were arranged on the counter. The pharmacist was very professional and reminded me of the need to be professional. (S11)*

#### **Theme 2. Integration of theory to practice**

The second theme identified from the student's focus group (which corroborated their reflective essays) was that the experiential learning activity provided an opportunity for them to apply theoretical concepts to practice. Students reported that they encountered some of the drugs taught/mentioned in the class and those not taught in the class. In addition, students explained that seeing the drugs, handling them, and dispensing them to the clients made the drugs and the experience real compared to the abstract theoretical class discussions. Students further explained that they were able to comprehend more of the theoretical instructions as they went through the experiential learning.

*Many drugs were taught in class especially in the pharmacology class. The class discussion provides a lot of information on drugs and sometimes the information is overwhelming. But seeing the drugs in the pharmacy and having the opportunity to check their information and compare with what was taught in the class made drugs real. In addition, the pharmacist gave us drugs to review and make presentations. That helped a lot to make me remember the drugs. It helped me to make many connections between what was taught and what I am seeing in real life. My thoughts were eventually invaded by drugs....I just kept thinking of drugs. (S3)*

*I was able to learn many drugs that have not been taught in class. My interaction with the drugs made me know more about them. Also, now when the drugs are mentioned in class, I sometimes see the picture of the drug on the shelf at the pharmacy even though I am in class. One thing I do is to note any drugs mentioned in class so that when I get to the pharmacy I quickly check them out in real-time. (S9)*

### **Theme 3. Pharmacy skills**

The third theme that emerged from the student's focus group that was also noted in their reflective reports was that experiential learning provided them the opportunity to learn skills in pharmacy practice. Students reported learning skills such as interpreting prescriptions, dispensing both prescription and OTC drugs, patient counselling, pharmaceutical calculations, and two students reported compounding drugs during the second phase of the experiential learning.

*I know some of the stuff was not taught in class but I did dispense prescription drugs and I sold over the counter drugs. I also taught the patients about the drugs such as the side effects of the drugs, interactions, and the need for adherence. (S6)*

*At my place of experience, the pharmacists check blood pressure, and sugar levels for patients. He taught me how to do it and allowed me to do it on the patients. I also did some compounding for children's drugs in addition to dispensing drugs to the patients. It was a fruitful experience on my part and I already feel like I am a real pharmacist. (S15)*

### **Theme 4. Challenges to early community practice**

The students reported a few challenges they experienced during the EPL. The main challenge reported by most students, especially during the first EPL was that they were nervous being in the pharmacy environment and were not sure how the preceptors will treat them. These challenges were majorly reported during the first posting. Students however reported overcoming their nervousness especially with the way the preceptors treated them. A few students expressed that the timing for the activity was challenging considering that they had to attend classes and do the activity.

*At first, I was very nervous because I was not sure how to function at the pharmacy or how the pharmacist will respond to me. I know that I have gone through the objectives of the posting and have been assured that it was going to be ok....but I was still nervous. However, the way the pharmacist was nice and did orientation for me, I became comfortable. (S1)*

*During the first posting, I chose to do my volunteer experience during weekends. With school work during the week and working during weekends, I became overwhelmed with both schoolwork and the volunteer service. However, I am passionate about pharmacy and wanted to learn so I kept on. It was different during the second posting. I was looking forward to the experience. (S4)*

## DISCUSSION

Early introductory professional pharmacy experiences are designed to help pharmacy students integrate concepts learned in the classroom to practice. These experiences help students to learn service, skills, and inter-professional relationships while meeting patient needs.<sup>7-8,11</sup> Because the Bachelors in pharmacy at the University of Belize is a new program, efforts are made to enhance students' experience while building competence at the early stage of the training. The 5-year BPharm program at the University of Belize and other developing countries focuses more on theoretical courses at the early stage of the training with little or no provision for clinical or community pharmacy experiences.<sup>6,12</sup> The results of this study are indicative of the need to include intermittent community and clinical experience opportunities at an early stage, in the training of pharmacy students at the University of Belize.

The scores observed from the first posting (Table 2) shows that the intended learning objectives of the EPL were adequately achieved. The main objectives of the first posting were to familiarize the pharmacy students with the general pharmacy environment and introduce them to basic pharmacy practice. Higher mean values were seen from the self-assessment questions where students reported that the experience helped them understand and appreciate pharmacy practice and the pharmacy environment. In addition, a higher mean score was seen with the overall experience as students reported it was a good learning experience. Furthermore, some of the scores seen during the second posting were significantly higher compared to the first posting with students reporting a general improvement in positive experiences compared to the first posting. The main objectives of the second posting were for students to integrate pharmaceutical theoretical knowledge with practice in terms of knowledge of OTCs and prescription drugs, dispensing, and patient counselling. These objectives were adequately achieved as students reported learning drugs that were not yet taught in class, improved communication, learned to measure blood pressure and glucose, and engaging in extemporaneous compounding. In addition to providing a positive and fruitful experience to the students, the EPL helped to build students' confidence in engaging in patient interactions care and build inter-professional relationships. The findings from the current study support previous studies that reported positive experiential learning outcomes when introduced early in training health professionals.<sup>2,13-15</sup> The significant improvement seen in the second posting when compared to the first could be attributed to confidence built during the first posting, the willingness of the preceptors to assist the students in providing the students with rich pharmacy experience, and the desire by the students to learn. In addition, since the experiential learning was a credit-bearing activity, students put in their best performance to obtain an excellent report from the preceptors. This study resonates with previous studies on the need for a holistic approach in the training of pharmacy students for effective practice.<sup>12,16</sup>

Results of the focus groups and students' reflective journals resonate with the reports from the student's self-assessment questions. The report from the students reinforced their abilities to integrate theory into pharmacy practice, understanding the pharmacy environment, learning new skills in pharmacy practice, and improved inter-professional relationships.<sup>2,17-18</sup> In addition, students reported encountering few challenges but were able to overcome these with the help of the preceptors. In this study, the preceptors played a major role in providing the students with a conducive learning environment to integrate theory to practice while building the student's confidence. Sosabowski and Gard (2008)<sup>19</sup> reported insufficient or lack of practice sites and the lack of appropriately trained preceptors in the United Kingdom, the situation in Belize is different in terms of the availability of community pharmacies and suitable preceptors.

The result of the present study revealed the insights gained on the perspective of introducing Belizean pharmacy students to early pharmacy practice. Although the number of students was small, the methodology for data collection provided sufficient analyses and information to guide the program review team. Furthermore, the study results provided the basis for future research in the field of pharmacy and other health professionals to enhance the development of practice competencies.

#### **Limitations:**

The study has a few limitations. No financial support was received in the conduct of the study as such investigators had to bore the cost study. Also, being a baseline study, the number of students and the analyses conducted did not provide sufficient statistical power for generalization. Despite these limitations, the experiences reported by the students and the baseline data generated is useful considering the limited studied in this area in Belize and the wider Caribbean. The study will serve as a guide in the design of large scale research in this area and will form part of the data for program review.

#### **CONCLUSIONS**

The pharmacy training at the University of Belize is evolving and experiential learning is crucial in the holistic training of pharmacists and other healthcare personal. At present, the early community pharmacy experience is not yet established. This study presented findings indicating the value of early pharmacy practice to produce pharmacists who are equipped to provide safe and effective pharmaceutical services, on par with regional and international standards of practice. Partnership with community pharmacists and government-owned healthcare facilities will provide an integration of theory to practice through well-designed hands-on experiences. Even though the study results will provide useful data for program review, the experience has helped to provide the students with a better understanding of the concepts of the pharmacy environment and profession.

## Conflict of Interest

The Authors declare that they have no conflicts of interest to disclose.

## Funding

No funding or grant was received for this study.

## REFERENCES

1. World Health Organization [internet]. The role of the pharmacist in the health care system: preparing the future pharmacist: curricular development: report of a third WHO Consultative Group on the Role of the Pharmacist, Vancouver, Canada, 1997. World Health Organization. [cited 2020 Nov 12]. Available from <https://apps.who.int/iris/handle/10665/63817>.
2. Rouse MJ and Meštrović A. Learn Today–Apply Tomorrow: The SMART Pharmacist Program. *Pharmacy*. 2020; 8(3):139.
3. Pan American Health Organization [internet]. Proposal for a Basic Plan for Pharmaceutical Education and Pharmacists' Competencies for Professional Practice. Washington, D.C. [cited 2020 Nov 12]. Available from <https://www.paho.org/en/topics/pharmaceutical-education>
4. Cheraghi MA, Salsali M and Safari M. Ambiguity in knowledge transfer: the role of theory-practice gap. *Iran J Nurs Midwifery Res*. 2010; 15(4):155–166.
5. Saifan A, AbuRuz ME and Masa'deh R. Theory Practice Gaps in Nursing Education: A Qualitative Perspective. *Journal of Social Sciences*. 2015; 11(1):20–29.
6. Factor EM, Matienzo ET and De Guzman AB. A square peg in a round hole: Theory-practice gap from the lens of Filipino student nurses. *Nurse Education Today*. 2017; 57:82–87.
7. Salifu DA, Gross J, Salifu MA and Ninnoni JPK. Experiences and perceptions of the theory-practice gap in nursing in a resource-constrained setting: A qualitative description study. *Nursing Open*. 2018 6(1):72–83.
8. Phillips KF, Mathew L, Aktan N and Catano B. Clinical education and student satisfaction: An integrative literature review. *International Journal of Nursing Sciences*. 2017; 4(2):205–213.
9. Husaini DC, Yusuf A and Harris-Thurton L. Pharmacist from day 1: Introducing university of Belize pharmacy students to early pharmacy practice. *World Journal of Pharmaceutical Research*. 2017; 6(17):216–228.
10. Morello CM, Singh RF, Chen KJ and Best BM. Enhancing an Introductory Pharmacy Practice Experience at free medical clinics. *International Journal of Pharmacy Practice*. 2010; 18(1):51–57.
11. Cox CE and Lindblad AJ. A Collaborative Approach to Improving and Expanding an Experiential Education Program. *American Journal of Pharmaceutical Education*. 2012; 76(3):53.

12. Mendonça S. de Freitas EL and Ramalho de Oliveira D. Competencies for the provision of comprehensive medication management services in an experiential learning project. *Plos One*. 2017; 12(9): 1-14.
13. Bheekie A, Adonis TA and Daniels P. Contextualising undergraduate pharmacy training in service-learning at the University of the Western Cape. *Education as Change*. 2007; 11(3):157–167.
14. Allodola VF. The effects of educational models based on experiential learning in medical education: an international literature review. *Tutor*. 2014; 14:23–49.
15. McLaughlin JE, Amerine LB, Chen SL, Luter DN, Arnall J, Smith S and Pinelli NR. Early Clinical Experiences for Second-Year Student Pharmacists at an Academic Medical Center. *American Journal of Pharmaceutical Education*. 2015; 79(9):139.
16. Marcos CR, Werlissandra MS, Alessandra RM, Sabrina CS, Divaldo PL, Wellington BS, & Angelo RA. Assessment of Brazilian pharmacy students perception of their level of preparedness for pharmaceutical practice. *African Journal of Pharmacy and Pharmacology*. 2017; 11(40):517–525.
17. Abdu-Aguye SN, Yusuf H, Agbale EO, Auwal FI, & Ma'aji HU. Connections between classroom theory & real-world practice: Exploring the perspectives of undergraduate students at a Nigerian faculty of pharmacy. *Pharmacy Education*. 2019; 19(1):185–189.
18. Suwannaprom P, Suttajit S, Eakanunkul S, Supapaan T, Kessomboon N, Udomaksorn K, Sakulbumrungsil R. Development of pharmacy competency framework for the changing demands of Thailand's pharmaceutical and health services. *Pharmacy Practice*. 2020; 8(4):2141.
19. Sosabowski MH, & Gard PR. Pharmacy Education in the United Kingdom. *American Journal of Pharmaceutical Education*. 2008; 72(6):130.