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PHARMACIST FROM DAY 1: INTRODUCING UNIVERSITY OF BELIZE PHARMACY STUDENTS TO EARLY PHARMACY PRACTICE

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ABSTRACT

Introduction: It is widely accepted that exposure to extracurricular experiences contributes to the development of values, skills, and knowledge enhancing the overall learning process. The University of Belize (UB) 3-year professional associate degree pharmacy training program incorporates two major experiential learning experiences in the course of its 3-year training. The current practice where UB pharmacy students go for their first practicum at the end of year two of training presented challenges to both the students and the pharmacists (preceptors). Lack of basic pharmacy skills commensurate with a second-year pharmacy trainee and the somewhat high expectations of the preceptors for performance called for an intervention by providing students with an early opportunity to acquire basic pharmacy skills before the official designated end of year 2 practicum. **Methods:** Students were assigned a minimum of 42 (1st exposure) and a maximum of 72 (2nd exposure) clock hours to volunteer at an approved community or hospital pharmacy of their choice. A checklist of expectations was agreed upon and same shared with preceptors. At the end of the assigned hours, the pharmacist submitted reports on the performance of the student while the student submitted reflection papers on their experiences using semi-structured reflection themes. The reports and the reflection papers were then evaluated for a grade. Data were collected both quantitatively and qualitatively. Results were presented in charts and tables as thematic representations while the grades for the students were presented as mean for each year. Independent samples t-tests were used to examine differences between group grade variables. **Results:** Students reported engaging in various activities (filled prescriptions, shelve organization, dispensed prescriptions, etc)

during both first and second exposures. All the students reported having gained confidence in the pharmacy environment after the exposures. Time constraints and too many drugs to learn were some of the negative experiences reported by the students. A significance ($p \leq 0.05$) difference was observed between the first and second experiential learning. Also, a significant ($p \leq 0.05$) difference was observed between volunteer grades and official grades at the end of practicum in all groups. **Conclusions:** Students gained confidence, knowledge and professional pharmacy related skills which are important for professional career progression and maturity.

KEYWORDS: Pharmacy education, practicum, skills, experiential learning, Belize.

INTRODUCTION

The transformational learning strategy where knowledge is acquired by a combination of real-life experiences is referred as Experiential Learning Experience (Kolb, 1984). Learning by doing or from experience while applying theoretical knowledge in order to develop skills or new thought process has been an effective teaching method (Lewis and Williams, 1994). When exposed to extracurricular experiences beyond the conventional academic settings, students develop values, skills, and knowledge that adds to the overall learning process of the student. Activities such as undergraduate research, internships, practicum, study abroad or professional work experiences have been employed to offer students opportunities for maximum learning. Sternberg and Zhang, (2000) described experiences that are concrete as the basis of observations and reflections. The reflections are further synthesized into concepts and ideologies from which new implications for definite action can be drawn. Testing these implications serves as guidelines in creating new experiences which invariably forms the different stages of learning. Experiential learning can be interdisciplinary where the experiential methodology incorporates and connects other subjects to create maximized real-world learning experience (Wurdinger, 2005).

Although experiences can be learned from varying activities, participation in a set of prescribed learning experiences does not necessarily depict something as experiential. According to Chapman et al., (1995), a patterned, linear or cyclical experience does not necessarily describe an experiential methodology rather a series of clearly defined but important working principles that must exist for some time and at varying degrees during the experiential learning process. No matter what experiential activity the student is participating in, these principles are required if experiential learning is needed.

Consequently, Chapman et. al., (1995) listed the attributes of these principles which include, the balance between theory and experiential activity; less interference by the instructor; learning activities for the student that are personally relevant; student able to make the connection between learning activity and the real world. Furthermore, the student must be able to reflect and connect theory to life; personal and emotional engagement of the student to the experiential learning process; re-examination of values; development of meaningful learning relationships and finally learning outside one's perceived comfort zones. In experiential learning, the context of learning differed from the conventional academic instruction. For instance, it is the responsibility of the student to manage their learning by identifying the knowledge, skills, and competencies they need to acquire and reflect on them as they go along (Moon, 2004). Students usually have clarity of purpose, able to explain their perspectives, aware of the guidelines for their discipline yet being open-minded to collaborate with others having a differing views.

The University of Belize associate degree pharmacy training program incorporates two major experiential learning experiences in the course of its 3-year professional pharmacy training. A 200 clock hours (5weeks) practicum at the end of the second year of the 3-year program. This is a first time exposure to introduce students to the practical aspects of the pharmacy profession. Also, a 512 clock hours (16 weeks) final internship at the end of the 3 year program. Students rotate through four different practice areas during this second practicum exposure. In addition, students in the final year of the program participate in therapeutic rounds at the referral hospital. These activities are conducted by students in real-world settings with carefully designed skills and competencies under the supervision of qualified practicing pharmacist serving as preceptors.

The current practice where UB pharmacy students go for their first practicum at the end of year two of training presented challenges to both the students and the pharmacists. The pharmacists expected the students to exercise skills proportionate to a second-year trainee while the students were just having a first exposure to pharmacy practice. The high expectations by the pharmacists for performance and the low (and often absence of) skills by the students presented some strain to both the pharmacists and the students. To address the issue, pharmacy students were given the opportunity to start gaining exposure in pharmacy practice from the first year they registered for the program. The aim was for the student to develop skills required for pharmacy practice before the designated official practicum at the

end of second year of training. This report was the outcome of the intervention made to address the gaps observed in the training of UB pharmacy students with regards to supervised pharmacy practicum.

METHODOLOGY

This study utilized both quantitative and qualitative methods for data collection. Students were assigned a minimum of 42 and a maximum of 72 clock hours to volunteer at an approved community or hospital pharmacy of their choice. The timing was at students' convenience (majorly during weekends) but hours had to be completed within the semester. Letters of introduction and terms for volunteer were given to the students to take to a licensed pharmacist of their choice within their communities. During the first experiential exposure, students were expected to be familiar with pharmacy environment while observing and participating in basic pharmacy related practices. During the second exposure, however, students were expected to progress from observation to actual "doing" or conducting pharmacy related activities but under supervision. At the end of the assigned hours, the pharmacist submitted reports on the performance of the student while the student submitted reflection papers on their experiences using semi-structured reelection themes. The reports and the reflection papers were then evaluated for a grade. The study was conducted from 2012 to 2015. Results were presented in charts or tables as thematic representations while the grades for the students were presented as mean for each year. Independent samples t-tests were used to examine differences between group grade variables. Significance was set at $p < .05$ for all tests.

RESULTS

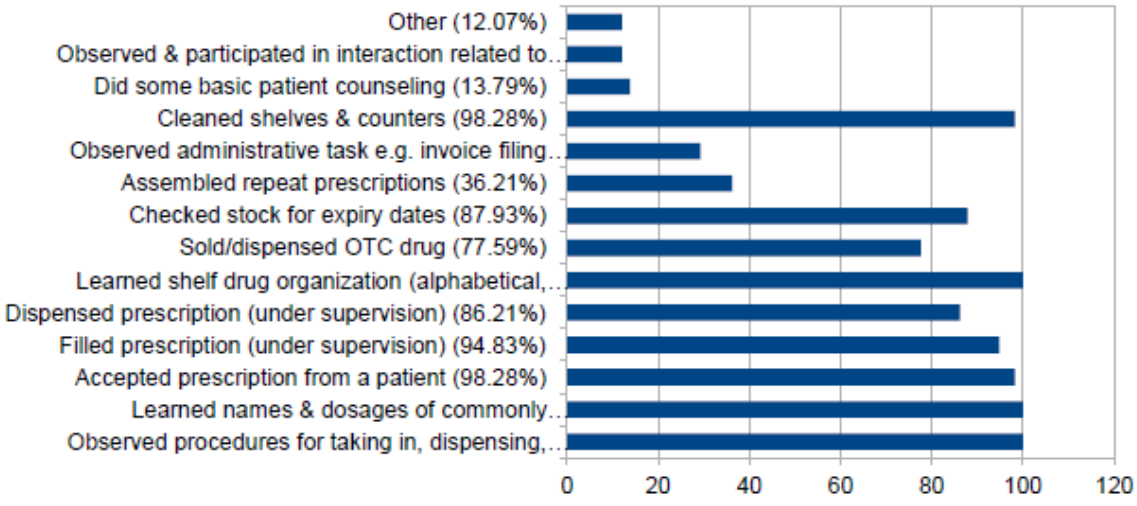

Fig. 1: Activities reported by students during first practical exposure (n=58).

The activities reported by students during the first experiential learning exposure superseded the expectations and goals of the intervention. Students reported filling and dispensing prescriptions, assembling repeat prescriptions, doing some level of basic patient counseling; observing some administrative tasks in addition to participating in interaction related to patient care (Figure 1).

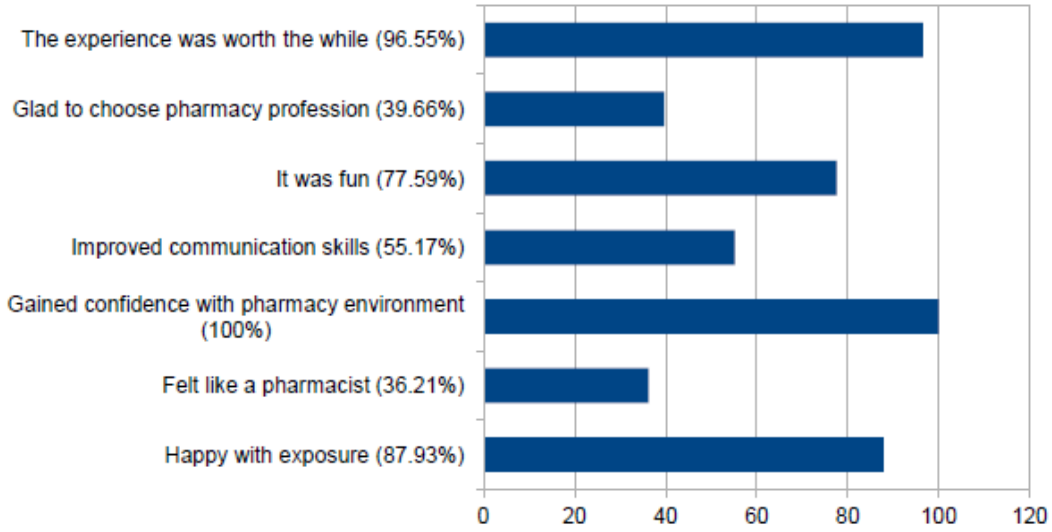

Figure 2: Positive experiences reported by students during first exposure (n=58).

All the students reported gaining confidence in the pharmacy environment while almost all (96.55%) reported that the experience was "worth the while" with many indicating other positive benefits associated with the practical exposure.

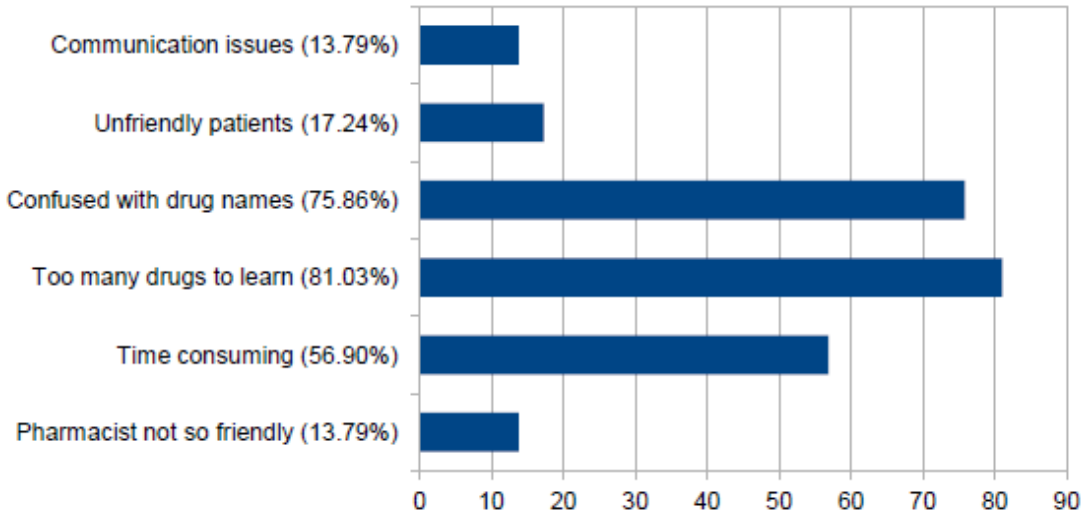

Fig. 3: Negative experiences reported by students during first exposure.

Fig. 3 showed negative experiences reported by students during the first exposure. Too many drugs to learn (81.03%), and confused with drug names (75.86%) were the highest negative experiences reported by the students.

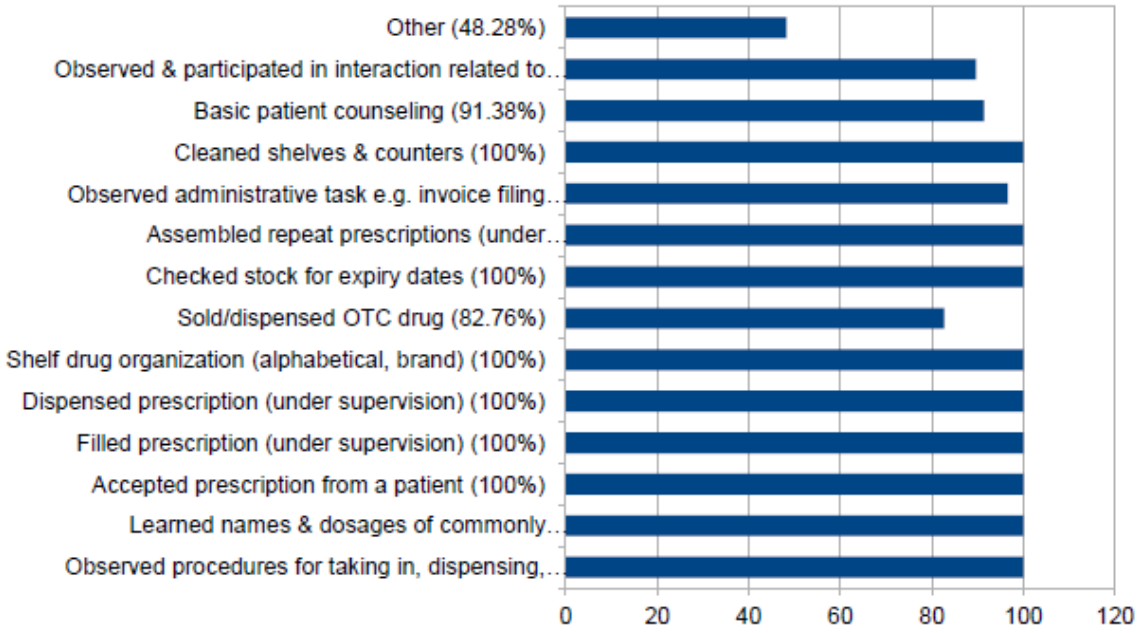

Figure 4: Activities reported by students during second exposure.

An improvement was seen in the level of participation by the students when compared with the first exposure (figure 4). Activities were in line with integrated experiential learning as aligned with classroom teaching. Students reported (other, 48.28%) participating in pharmaceutical calculations and basic compounding.

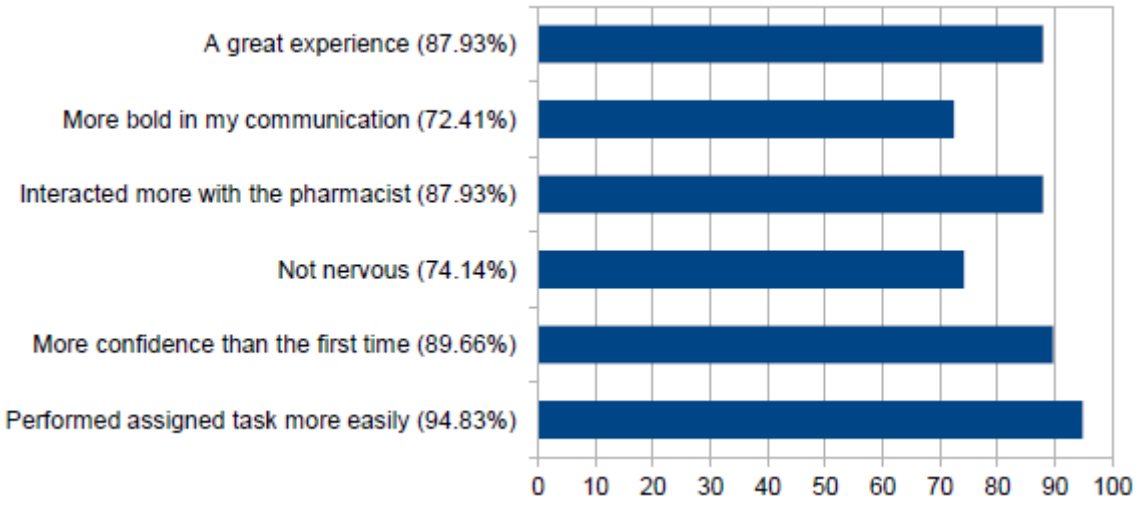

Fig. 5: Positive experiences reported by students from second exposure (n=58).

Majority of the students reported increased confidence and boldness during the second exposure (figure 5). Overall, students reported "performing assigned task more easily" (94.83%) and considered the experience a great one (87.93%).

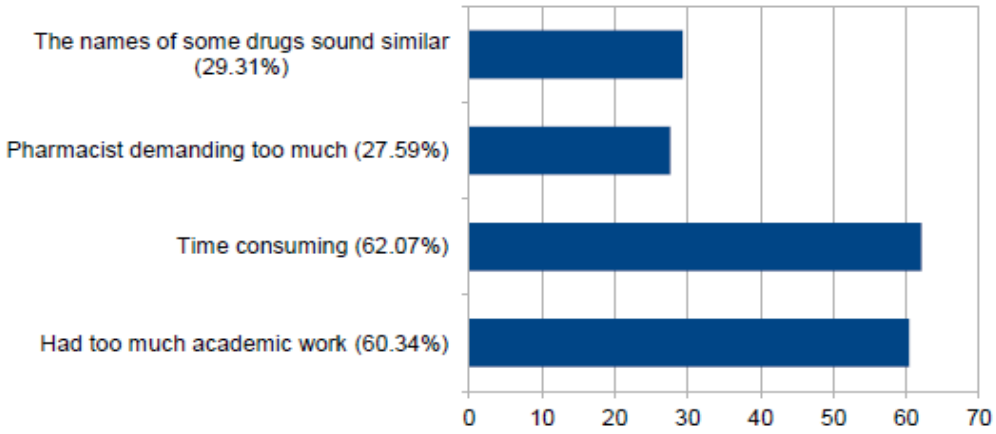

Figure 6: Negative experiences reported by students from second experienced.

Table 1: Students volunteer and official designated grades.

Year	2012 (n=14)	2012 (n=14)	2013 (n=7)	2013 (n=7)	2014 (n=20)	2014 (n=20)	2015 (n=4)	2015 (n=4)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Experiential (volunteer) learning grade exposure 1	No data**	No data**	80.28	7.41*	79.45	8.30*	85.5	6.45*
Experiential (volunteer) learning grade exposure 2	No data**	No ata**	86.45	4.76*	84.32	6.98*	86.39	13.47
Official practicum site grade at the end of 2nd year	88.60	4.88	91.86	4.41*	88.15	7.01*	87.0	11.34*
Official practicum final site grade at the end of 2nd year	89.92	4.16	92.79	2.91*	89.3	5.48	89.13	8.80

*Data analyzed using independent samples t tests to determine group differences. $p < 0.05$ indicate significant differences between groups.

**Students did not participate in volunteer practicum.

Although a total of 58 students participated in the overall experiential volunteer intervention program for 2012 to 2015, a number of students did not follow their study sequence or did not meet the requirement to participate in the official practicum hence the number of those that finally did the practicum was not up to the students enrolled in the original experiential exposure. For this intervention, only the results of 31 students who successfully completed the official pharmacy practicum at the end of the second year were reported. The result of 2012 students was presented to enable comparison between the non-volunteer and volunteer groups.

A significance difference was observed between the first and second experiential learning exposures. Except for 2015, all the grades obtained by students showed a significant improvement when compared to the first experience. A significant ($p \leq 0.05$) difference was also seen in all groups between volunteer grades and official grades at the end of practicum. Finally, a significant ($p \leq 0.05$) difference was observed between volunteer grades and official grades at the end of practicum in all groups. Except for 2013, no significance difference was seen in final practicum results among groups (Table 1).

DISCUSSION

Training pharmacy students in knowledge, skills and critical thinking is a major focus of pharmacy education. The competencies expected in training pharmacist includes building confidence in the students by providing the requisite knowledge, professional judgment, and the abilities to execute relevant clinical skills (Epstein & Hundert, 2002) in the real world at the end of the training.

The main objective of this study was to expose first and second-year pharmacy students to pharmacy practice before the official designated pharmacy practicum at the end of year two of training. At the first stage of exposure, students were to observe the pharmacist and learn basic pharmacy related procedures such as accepting, filling and dispensing prescriptions while learning the brand and generic drugs commonly dispensed at the community pharmacies. The exposure was to familiarize them with the pharmacy environment while learning basic pharmacy processes. The report by the students during the first experiential exposure exceeded the goals and expectations of the interventions. Students reported not only observing and learning basic pharmacy related procedures but actively participated in conducting some of them. Although the number of students that reported being involved with activities such as patient counseling was small at the first stage of the exposure, it was encouraging to see the enthusiasm and zeal of the students in carrying out such activities under supervision. At the first stage of the exposure, all the students reported gaining confidence with the pharmacy environment and indicated that the experience "was worth the while." The majority (87.93%) of the students reported being happy with the exposure while some (77.59%) said: "it was fun."

Boyter and Winn (2015), reported core principles to be adopted in pharmacy experiential learning. These principles included among others, integrating experiential learning with classroom teaching; providing appropriate students support; students having a comparable

learning experience; accessible to intended learning objectives (both students and preceptors); students involved in facilitated discussions and while at the same time keeping a reflective diary of knowledge learned, skills gained and competencies achieved. Although the current intervention was a course-based experiential learning, some of these core values were incorporated in the experiential learning process with the goal to build student confidence in pharmacy practice before the official practicum at the end of the second year. At the end of the second exposure, students reported (table 4) participating in pharmacy-related activities that were comparable to a third-year trainee. Learning activities for the students in these instances were personally relevant and the students were able to make the connection between learning activities and the real world (Chapman et. al., (1995). An improvement was also seen in the level of participation by the students when compared with the first exposure. At the onset of the study, the classroom learning and the experiential learning experiences were properly aligned to ensure students get the maximum competencies as they attend classes and go for experiential learning. Students also reported learning the names and uses of many drugs which helped them during classroom instructions. By the second exposure, most students expressed increased boldness to do basic patient counseling and some level of compounding in addition to other routine pharmacy-related tasks.

During the second experiential exposure, students reported remarkable improvement in communications skills both with the pharmacists (preceptors) and with patients (figure 4). Pharmacist uses their interpersonal communications daily in counseling patients, interacting with associates or while communicating with physicians and other members of the health team. To ensure best therapeutic outcomes while improving the use of medications by patients, interpersonal communication skills are important and an indispensable tool to the pharmacist (Randy et al., 2006; Ali et al., 2003). Communication skill is an essential core competency in training student pharmacists. The result of this experiential learning indicated an improved boldness and confidence in communication skills by the students. Students reported conducting basic patient counseling and improved interaction with the pharmacist. Although some of the students who were not bi-lingual (English-Spanish) had some difficulty communicating with some of the patients, the difficulty made the students have an increased appreciation for learning Spanish which is one of the training requirements for pharmacy students at the University of Belize. The experiential learning created an awareness to the students to see their need for improved communication skills as they prepare for a career as future pharmacist. Appropriate patient counseling and other strategies have been reported to

improve patient compliance and adherence to medication therapy (Varma et al., 1999; Doucette et al., 2005; Randy et al., 2006). Doucette et al., (2005) further reported that drug therapy problems can be resolved effectively with physicians by properly written communications by the pharmacist in addition to verbal communication. Exposing the students to experience professional communication skills at this stage of their training greatly prepared them for the future.

It was also evident from these exposures that the students applied knowledge gained in the classroom to acquire skills during the experiential learning. Additionally, the grades submitted by the pharmacist indicated an improvement in the professional skills acquired by the students. Bond and Cone (2012), reported that the application of skills, knowledge capabilities and experiential rotations is seen more with students who are confident as compared to those who aren't. Such students are more positive and likely to embrace greater challenges affiliated with patient care and will probably gain more abilities indispensable for professional and fundamental proficient deep-rooted learning. In this intervention, our aim was to build the confidence of the students to apply the knowledge gained in the classroom for acquiring professional pharmacy skills through experiential learning. Building the students confidence overall will help them face new patient pharmacy related challenges while acquiring life-long professional skills. The report by the students after the second exposure and the final grades after practicum (table 1) was a strong indication that these goals were achieved. Although the study was delimited to the end of second-year official practicum, most of the students performed exceptionally well during their final internship rotations at the end of the third year.

Miller (1990), in his triangle of learning, reported that progressive changes take place with every task where it moves from observation to active engagement. In this intervention, the students demonstrated a progressive development through first observing and then doing the tasks assigned to them. Although the experiential learning experience was of a short duration, it was designed to allow students observe the behaviors and roles of the pharmacists with the intent of becoming familiar and comfortable with the responsibilities of the pharmacy environment and functions. Because of the diversity in the number of pharmacies found in Belize, the experiences student had from various locations varied. The services provided by different locations, the population of the patients that visited the pharmacy, the nature of the pharmacy and the preceptor’s bias differ with different locations. With all the variations,

useful insights gained by the students at the experiential learning made them understand the principles of pharmacy practice, and that, it is acceptable for practice to differ as long as the right set goals are accomplished within best set-practices. Even though the experiential learning intervention had a number of limitations, it went a long way to help students gained skills and made them thoughtful reflective professionals while broadening their perceptions about pharmacy practice.

CONCLUSION

Providing educational experiential opportunities for pharmacy students to acquire knowledge, skills and a sound professional judgment will raise their professional confidence and make them face new challenges related to patient care with confidence. This intervention provided the University of Belize pharmacy students an opportunity broaden their knowledge and skills by involving them in volunteer experiential learning exposures. Students gained confidence, knowledge and professional pharmacy related skills which are important for professional career progression and maturity. Although the result of this intervention is being still discussed by the pharmacy team for consideration as part of regular student activities for the students at the university, whether the report becomes officially accepted to be part of the of the curriculum or not, students will benefit tremendously if allowed to participate in the future interventions of this nature. Both knowledge, skills, and attitudes will be impacted on the students as a result of such exposures.

LIMITATIONS

This study had a few limitations. The number of students admitted annually to the pharmacy program is relatively few, hence the small samples seen in this study. The inability of the students to follow their designed academic sequence was a limitation. The rotational nature of the practice site limited the monitoring of students' progress from one site. The lack of objective assessment tool and probably the preceptor's bias could have posed a likely limitation in terms of student's final assessment. The students' abilities to combine volunteer experiential learning, academic learning, and travel between two campuses might probably constitute some of sort of strain and a kind of limitation to their overall reporting and overall performance. With all these limitations, however, the significance of the intervention was to improve students professional pharmacy skills acquisition through experiential learning. The report of current intervention indicated this purpose was achieved especially that a similar study has never been conducted at the University of Belize hence the strength of the study.

Since the program has just been upgraded from a professional 3-year associate degree to a 5-year bachelors degree, further research might be conducted with a design to advance these principles.

CONFLICT OF INTEREST

None declared.

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