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Online Experiences of Pharmacy Practices during COVID-19 Pandemic in Pharmacy Program in Jordan

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ABSTRACT

Introduction: The pandemic of COVID-19 caused a great challenge to clinical pharmacy programs. Global and local restrictions imposed by prevention and disease control bodies have made clinical training programs hard to implement on campus and/or in hospitals

Aims & Objectives: To evaluate the effectiveness of a distance-assembled clinical training program for pharmacy students in Jordan during the COVID-19 pandemic

Place and Duration of Study: This study was carried out from July to September 2020 at the College of Pharmacy, University of Petra, Amman-Jordan

Material & Method: A Cross-sectional study survey that surveyed pharmacy students during the summer course quasi-experimental design using a post-test-only approach. Only pharmacy students during the summer of 2020 were enrolled in this study. Final year, 4th and 5th year.21 fourth and fifth pharmacy students completed the study. Students from other years were excluded. Specific patient data collection sheets were distributed to pharmacy students enrolled in an integrated pharmacy course in the summer semester from July to September 2020. After data collection, students were asked to develop a detailed pharmaceutical care plan. All sheets and care plans were collected from students, and a course evaluation questionnaire was utilized to measure the outcome of this distance learning approach. This approach focused on vital elements of therapeutic supervision involving appropriate drug indication, drug efficiency, drug safety, and inpatient compliance. The main variables tested in this study were students' demographics, including gender and year. The second questionnaire consisted of student's valuation of the clinical pharmacy supervisor. The third (questionnaire consisted of student's evaluation of the collection sheets and care plans for their patients

Results: The results from the post-training questionnaire showed that the majority of students reported an apparent improvement in knowledge and clinical skills. Qualitative responses by participating students showed positive responses associated with this distance learning approach, suggesting the possible benefit of such approach on long-term clinical pharmacy education.

Conclusion: A successful outline of a distanced organized clinical training for pharmacy students has been established during COVID19. Both the patients and the students assigned to them benefited from this clinical pharmacy educational experience.

Keywords: COVID-19, coronavirus, online course, University of Petra, pharmacy education

INTRODUCTION

Since the beginning of the year 2020, the emerging coronavirus (COVID-19) disease was swiftly turning into pandemic causing a huge impact on all human lives worldwide. The coronavirus disease had been announced as a pandemic by The World Health Organization WHO[1]. Hospital training and university campus classes postponement is a cautionary step throughout the pandemic. Therefore, a need to generate an active online distance clinical training was a top priority[2,3]. Two decades ago, pharmaceutical university schooling and pharmacy practice in Jordan grew to embrace growing figures of pharmacy students. A necessity for pharmacists has expanded to cope with the increased amount of community drugstores which is currently exceeding 2000 pharmacies all around districts of Jordan[5].

Currently, but before the COVID-19 pandemic, an introductory pharmaceutical practice training program was mandated for all faculties of pharmacy with a Bachelor of Science (BSc) in pharmacy nationwide[4]. The clinical training was obligatory and can be completed in local hospitals or community pharmacies[4].

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In Jordan, pharmaceutical care providers are pharmacists holding either Doctor of Pharmacy (PharmD) and BSc of pharmacy degrees where they are permitted to advice, dispense medicine, and deliver pharmacological organization and supervision for patients in community and healthcare facility sets[6,8]. There is cumulative evidence that shows providing medicinal care plans in community pharmacies is the role of pharmacies
According to recent reports, there is a gap in clinical pharmaceutical training concentrating on patient-centered detailed pharmaceutical care, where pharmacy students have the opportunity to interact with patients. To fulfil this gap during COVID-19, we proposed online distance clinical training for pharmacy students (fourth- and fifth-year students). This online training comprised of three main elements: pharmacy students, the clinical pharmacy supervisor responsible for teaching and mentoring, and finally the patient (selected by students from their own relatives or friends). The purpose of this study is to assess the effectiveness of a distance assembled clinical pharmaceutical training for university of Petra college of pharmacy students during COVID-19 pandemic.

MATERIAL AND METHODS

Cross-sectional study survey that surveyed pharmacy students during the summer course quasi-experimental design using a post-test-only approach. This program is explained in detail below.

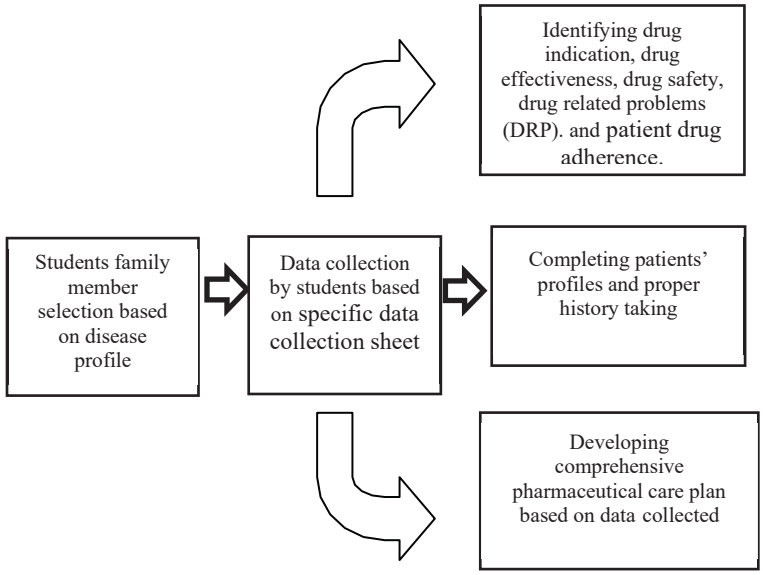
Patient data collection

Patient data collection sheets were distributed to pharmacy students who were enrolled in an integrated pharmacy practice course in the summer semester from July to September 2020. The research proposal was approved by the university's (Petra University-Joint Institutional Review Board) ethics committee (UOP-JIRB no.: Q2/4/2020).

All students signed consents forms prior to questionnaire filling. Moreover, the ethical committee in faculty of pharmacy and medical sciences approved this research. Patients were selected bby convenient sampling method on the condition of having more than one long-lasting illness such as diabetes mellitus and hypertension and/or heart failure, dyslipidemia and coronary heart disease. Case investigation included mainly the medical condition (required to have more than one non-communicable diseases (NCD)), medications, and availability of laboratory information. Students also were required to refer to clinical practice guidelines resources as taught in the parallel therapeutics' courses.

The distribution of patient data collection sheets for one close relative of pharmacy students and make the students develop a detailed pharmaceutical care plan accordingly.

Figure 1: Flow chart of the study design.



The collected data included the following for each patient: Demographics, Medical information/allergies, Drug therapy information, Behavioral and lifestyle, Social\Economic history.

Firstly, demographic data included, Patient name; only initials; to keep patient privacy, Age, Address, Gender, and Nationality. Secondly the medical information included, The chief complaint, medical history and a history of current illnesses /family history/ drug allergies, Vital signs and other information (Temperature, blood pressure, respiratory rate, pulse, height, weight, O2-oxygen-saturation).

Thirdly, drug therapy information included medical indication, generic and brand name of current drugs patient is on, strength, frequency, and efficacy, in addition to possible side effects. Fourthly, the behavioral and lifestyle of the patients were also demented including diet, exercise, tobacco\alcohol\caffeine use, personality type, and socioeconomic status.

Students developed a comprehensive pharmaceutical plan based on data collected

After this detailed data collection of patient medical cases, students identified drug related problems (DRP). Students focused on the appropriate drug indication, effectiveness, safety, and patient drug compliance.

An inquiry by students was done to develop a comprehensive medicinal supervision strategy for their patients. All sheets and care plans were collected from students and a course evaluation questionnaire was used to measure the outcome from this distance learning course. Students were required to prepare a pharmaceutical care plan in view of every medical condition, therapeutic goals, DRPs, guidelines, non-pharmacological and pharmacological treatments, in addition to follow-up and monitoring elements. The current study participants were 21 fourth and fifth pharmacy students who were enrolled in faculty of pharmacy, University of Petra.

This distance pharmaceutical training began in July and ended in September 2019 part of integrated pharmacy practice. Students were mentored and kept under weekly contact with their clinical pharmacy supervisor. Students prepared case summary along with the pharmaceutical care plans and eventually presented them in oral case discussions by the end of summer semester.

Student Evaluation after developing pharmaceutical care plans

Students were evaluated on patients' cases by weekly discussions. grades were given based on the completeness of data collection and pharmaceutical care plans. Follow-up for cases continued through the semester and the magnitude of the benefit of this follow-up was collected by a questionnaire submitted by students at the end of the semester.

Questionnaire elements

Questionnaires were planned to assess the competency of the current distance learning program and the satisfaction of students.

The first questionnaire consisted of students' demographics such as gender and student's year. The second questionnaire consisted of student's valuation of the clinical pharmacy supervisor. The third (questionnaire consisted of students' evaluation of the collection sheets and care plans for their patients. Responses were measured on scale of Strongly disagree, Disagree, Neutral, Agree, strongly agree. Moreover, the last questionnaire consisted of whether the student would recommend this experience of distance learning for the other pharmacy students and the sixth questionnaire comprised of characterizing student learning outcomes and level of effort invested in this training. The end comprised of the student family members (relatives) openness to answer lifestyle and history questions.

RESULTS

A total of 20 students out of 21 completed the questionnaires.

Student's population demographics and the online training experiences

A total of 65% of students were females. Furthermore, most students were at senior level (75%). Also, 60% of students had the opportunity to be trained in a hospital and/or community pharmacy prior to joining this online training **Table 1.**

Table 1: Student's population demographics (n=20)

Characteristic	Sample n (%)
Gender	
• Female	13 (65)
• Male	7 (35)
Level (Year)	
• Fifth year (graduate)	15 (75)
• Fourth year	5 (25)
Trained before in hospital/community pharmacy	
• Yes	13 (60)
• No	4 (20)
• Maybe	3 (15)

The online clinical training assessment

Questions measuring the learning outcomes and level of effort invested in this training by students are summarized in Table 2.

Questionnaire answers were labeled on a 5-point Likert scale.

The clinical training program objectives was clear for a substantial number of students, moreover, an agreement between students concerning the availability of resources for the students was obtained and case arrangement files needed were obtainable. Students agreed that number of hours needed for the learning practice was applicable. Many students agreed to indorse this clinical training for other peer students Table 2.

Table 2: The online clinical pharmaceutical training overall assessment by students (n=20)

Characteristic	Sample n (%)
Level of effort invested in this online training	
• Excellent and very good • Satisfactory	15 (75) 5 (25)
Level of skill/knowledge after finishing the online training course	
• Excellent and very good • Satisfactory and fair	14 (70) 6 (30)
Contribution of training to your skill/ knowledge	
• Excellent and very good • Satisfactory and fair • Poor	14 (70) 5 (25) 1 (5)
I endorse this clinical training for my other peers	
• Yes • No	17 (85) 3 (15)

Table 3: Participants Preceptor assessment (n=20)

Characteristic	Sample n (%)
The instructor was an effective lecturer and demonstrator	
• Disagree • Neutral • Agree	1 (5) 1 (5) 18 (90)
Instructor stimulated student interest	
• Disagree • Neutral • Agree	2 (10) 2 (10) 16 (80)
Instructor was available and helpful	
• Disagree • Neutral • Agree	1 (5) 2 (10) 17 (85)
Grading was prompt and had useful feedback	
• Disagree • Neutral • Agree	2 (10) 0 (0) 18 (90)

As shown in table 3, most students sensed that the instructor's evaluation of their presentations and grading was good. Also, students found the instructor was an effective lecturer and demonstrator. Students thought that the instructor was available and helpful for them to answer questions and mentor them. Most agreed that the instructor was stimulated their interest Table 3

Students' self-assessment of their medical information and clinical pharmaceutical skills

As shown in table 4, students rated their abilities in gathering and interpreting patients data from uuniversal treatment standards to be high. Students (80%) rated their abilities and skills in displaying clinical cases as elevated. Additionally, approximately 80% had deeper insight of pharmaceutical care after this clinical training. Moreover, students felt that their pharmacotherapy planning skills was high too, Table 4.

Table 4: The knowledge and clinical abilities evaluation for students (n=20*)*

Question	Sample n (%)
How might you evaluate your abilities in Assembling and interpreting data from rehearsal treatment guidelines after this (relative patient case data collection and care plan) ?	
• Low • Neutral • High	3 (15) 5 (25) 12 (60)
How could you evaluate your pharmacotherapy preparation competencies after concluding this training (relative patient case data collection and care plan)?	
• Low • Neutral • High	0 (0) 5 925) 15 (75)
I consider myself to acquire greater awareness of pharmaceutical care concept after this training (relative patient case data collection and care plan)	
• Low • Neutral • High	1 (5) 3 (15) 16 (80)
I was capable of practicing the data delivered in the hypothetical guides to this educational clinical experience (relative patient case data collection and care plan)	
• Low • Neutral • High	0 (0) 4(20) 16 (80)
How might you evaluate your abilities in offering clinical cases?	
• Disagree • Neutral • Agree	4 (20) 0 (0) 16 (80)

Students' assessment for this online teaching in terms of relative patients benefit

As shown in **table 5,** students agreed that this online course improved the health status and knowledge of our targeted patients. Interestingly, during data collection phase the targeted patient (80%) was open to answering objective questions; such as disease history/social life/dietary habits, Table 5**.**

Table 5: Participants course assessment for the patients benefit (n=20)

Question/statement	Sample n (%)
Relative patient case data collection and care plan training improved the health status and knowledge of our targeted relative	
• Yes • No • Maybe	19 (95) 0 (0) 1 (5)
During data collection phase the targeted relative was open to answering objective questions; such as disease history/social life/dietary habits	
• Yes • No • Maybe	18 (80) 1 (5) 3 (15)

DISCUSSION

Pharmacy practice has been evolving since decades worldwide, concentrating on pharmaceutical care and patient-centered approaches[11,18]. In Jordan, pharmaceutical clinical trainings are mandatory at most pharmacy college curriculums with limited focus on applying theory to field practice[19].

In Japan, a recent report showed that local pharmacists had a significant role in providing pharmaceutical care for patients in their homes. Therefore, introducing homecare clinical pharmacy training should be an essential part of pharmacy curriculum. In this work, students had the opportunity to make piloted patients' cases that represent simulated experiences of patients' homecare. Furthermore, our study concluded that these patients simulated cases were valuable tools for clinical training. Patients simulated cases were an important educational strategy that may help in health promotion associated with homecare by pharmacists. A total of 90% of our students stated that our online pharmaceutical care improved the health status and knowledge of their targeted patients.

To our most recent knowledge, the current pharmaceutical clinical online training in a BSc of pharmacy program is utilized to complement pharmacy practice experiences in Jordanian pharmaceutical academia, particularly in COVID-19 circumstances. Our online clinical training objective is to teach our students pharmacy practice principles of pharmaceutical care in a patient-centered manner. The students applied the essential elements of pharmaceutical care, concentrating on their patients to find possible and/or actual DRPs followed by appropriate interventions to meet those DRPs. Our online teaching course was designed to cover accurate patient's data collection, detailed patient questioning and strong patients' evaluation abilities. Students were instructed to obtain correct information from many evidence-based medicine databases. The general impression for this online teaching course through the students was extremely optimistic. Similarly, depending on the statements of the students it was clear that this online course assisted students to understand the basic elements of pharmaceutical care implementation and helped them to distinguish their specialized role as pharmaceutical care providers. Another virtue for our online course is the openness of patients to answer data collection questions which was important in establishing a complete patient profile to be able to asses DRPs and write an accurate care plan.

Interestingly, DRPs related to drug effectiveness, safety (adverse drug reactions) and adherence issues were frequently met. One of the mutual DRPs was linked to the correct dose of medicines, particularly antihypertensives and antidiabetic. Other common complications were the use of herbal medicines instead of prescribed antihypertensives and antidiabetics. The follow-up and monitoring failure were also an issue. Consistent with our results, Previous studies mostly during COVID-19 pandemic showed significant positive perceptions of online learning experience; those studies tested over 3000 medically students[21,27].

On the contrary, in two studies, negative studies perceptions centered mainly on internet access[28, 29.] Moreover, struggle in developing clinical skills online in some studies contrary to our results were also shown in other reports[28.]

Limitations

In the current study, we did not have a pre-post assessment. we evaluated the online training course at the end of it. Furthermore, the sample number (participants) were limited; only 20 students, we suggest implementing this approach during next semesters where larger number of students may be

enrolling. We also suggest implementing this online training course in multiple pharmacy colleges across Jordan and abroad.

CONCLUSION

The current online training during the COVID-19 pandemic showed that it is possible to introduce an online pharmacy practice program to improve students' clinical skills by utilizing the data of their relatives or friends, allowing for data collection and formulating relevant pharmaceutical care in students' local environment. Consequently, prospective larger students sample size is necessary to verify the benefit and the feasibility of this online course. Students stated positive recognition towards the instructor and this online clinical training program. They correspondingly described enhancement in their clinical and pharmaceutical care knowledge and skills. The current report shows that the current online clinical training during the COVID19 pandemic is successful and useful.

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