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Short communication

COVID-19 impact on pharmacy education in Saudi Arabia: Challenges and opportunities

Mansour Almetwazi^a, Nourh Alzoman^b, Shaza Al-Massarani^c, Aws Alshamsan^{d,*}^a Department of Clinical Pharmacy, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia^b Department of Pharmaceutical Chemistry, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia^c Department of Pharmacognosy, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia^d Nanobiotechnology Unit, Department of Pharmaceutics, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia

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ABSTRACT

The first case of COVID-19 was announced at the end of year 2019, and later many cases were identified worldwide. In Saudi Arabia, the first case was announced on 2 March 2020. To prevent the spread of this pandemic disease, many precautionary actions were taken by Saudi government. One of these actions was closing public and private schools and universities and transfer the educational activities to virtual platforms. All colleges of Pharmacy in Saudi Arabia, whether the 21 public or the eight private ones, were affected by those sudden transitions and their responses varied according to their preparedness levels. Here we shared our experience in King Saud University in the curricular components of pharmacy school that includes classroom teaching, laboratory teaching, experiential training, assessment, and extracurricular activity and student support during COVID-19 compulsory lockdown. Lastly, we presented the lesson learned toward pharmacy education from COVID-19 pandemic.

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1. Introduction

The World Health Organization (WHO) Regional Office in China was informed on December 31, 2019, of cases of pneumonia of unknown causes detected in Wuhan City, which were identified later on to be among the first cases of COVID-19 reported (WHO, 2020a). On March 2, 2020, the Ministry of Health (MOH) in Saudi Arabia announced the first positive case of COVID-19 (MOH, 2020a). Then, the WHO announced COVID-19 outbreak as a pandemic on March 11, 2020 (WHO, 2020b). As of August 11, 2020, a total of 291,468 confirmed cases of COVID-19 were announced in Saudi Arabia (MOH, 2020b). Many precautionary and preventive actions were taken by the Saudi government to contain the spread of COVID-19 including temporary closure of universities and other

educational institutions, and the transfer of all educational activities to virtual platforms (Alshammari et al., 2020).

The Ministry of Education (MOE) called for an online brainstorming meeting with all Deans from public and private health colleges in Saudi Arabia and gathered all recommendations. As a result, MOE published a guidance for university-level examination and assessment during COVID-19 temporary closure (MOE, 2020a). All colleges of Pharmacy in Saudi Arabia, whether the 21 public or the eight private ones, were affected by those sudden transitions, and their responses varied according to their preparedness levels.

Pharmacy education in Saudi Arabia has been through several evolutionary stages since 1959. Prior to 2002, King Saud University (KSU) was the only university in the Kingdom that offers a pharmacy degree. A four-year Bachelor of Pharmaceutical Sciences program commenced in 1959, which evolved into a five-year program by 1979 with the introduction of clinical pharmacy discipline to the curriculum. By 2010, the five-year program was renamed as Bachelor of Pharmacy (BPharm), and a six-year Doctor of Pharmacy (PharmD) was introduced (KSU, 2020). Both curricula contain classroom teaching, laboratory and tutorial sessions, as well as experiential training, and both qualify graduates to be practicing pharmacists.

During the first few days of COVID-19 outbreak, before the pandemic announcement, the College of Pharmacy at KSU has assem-

* Corresponding author at: College of Pharmacy, King Saud University, P. O. Box 2457, Riyadh 11451, Saudi Arabia.

E-mail address: aalshamsan@KSU.EDU.SA (A. Alshamsan).

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bled an Emergency Response Team headed by the Dean and involved Vice Deans and faculties who are involved directly in the academic and training procedures. Here we shared the experience of our college in the aforementioned curricular components during COVID-19 compulsory lockdown.

2. Transitions in classroom teaching

Immediately after the lockdown announcement, transition from typical classroom teaching to virtual classes was compulsory. Therefore, in order to ensure the delivery of unified material and assessments, the college took several measures. First, all students' sections of the same course were merged in the academic learning system (Blackboard). Simultaneously, the college (information technology (IT) unit created video series to guide faculty on how to use Blackboard to conduct academic activities such as recording lectures, building exams, and providing any other material. The videos also covered alternative software options to record lectures e.g. MS PowerPoint and how to convert such files into Blackboard compatible format. All videos were revised by the Vice Dean of Academic and Educational Affairs and approved by the Dean and got immediately published on the college's website, YouTube channel, and Twitter account (YouTube, 2020a). Finally, the college assembled an on-call technical-support team to assist faculty with Blackboard. The team was led by the head of IT unit and composed of male and female faculty members and students who are familiar with or have been trained on Blackboard.

3. Transitions in laboratory teaching

Laboratory teaching in pharmacy education is essential because it provides students with necessary hand-on skills that are indispensable to pharmacists. In 2019, the National Center of Academic Accreditation and Evaluation published national PharmD program learning outcomes (PLOs). Henceforth, all national PharmD curricula are expected to aim for those PLOs. Among the 18 learning outcomes, nine outcomes are under the Skills and Practice domains. This indicates the value of laboratory teaching to understand the taught subject, improve teamwork skills, and build analytical and critical skills. As a result of the sudden transfer to virtual teaching, students inevitably missed the opportunity to comprehensively acquire laboratory skills. In order to mitigate that impact, laboratory sessions were replaced with video demonstrations of experimental work and shared with students. Although this approach helped students to gain conceptual understanding, students are still deficient of the hand-on skills. To compensate for this shortcoming, missed skills will be covered in other relevant courses. Furthermore, the college submitted a recommendation to the Vice President for Academic and Educational Affairs to be considered as part of KSU reopening plan where a student section is divided into two subgroups, and each subgroup will attend a two-period laboratory session every other week. This arrangement aligns with precautionary measures, including social distancing and compensates for the intermittent scheduling. Besides, video demonstrations will be sent to students prior to their attendance to the hand-on session to minimize their presence time in the lab.

4. Transitions in experiential training

Both Introductory Pharmacy Practice Experience (IPPE) and Advanced Pharmacy Practice Experience (APPE) are mandatory in PharmD programs. Two days before the WHO announced that COVID-19 outbreak is considered a pandemic, the Experiential Training Unit (ETU) had suspended the training for one week and worked on a response plan. Regarding IPPE, the college transferred

the training to a virtual dispensing platform that was supervised and monitored by preceptors. IPPE trainees were evaluated according to the ETU IPPE manual. On the other hand, APPE was more challenging to handle as it is composed of an internship year, in which hospital-based cycles are the majority. During training-suspension week, all interns were requested to attend the WHO Infection Control course named "emerging respiratory viruses, including COVID-19: methods for detection, prevention, response and control" (WHO, 2020c). Also, all APPE preceptors were contacted to discuss possible scenarios and methods to provide optimum training. By the end of that week, all interns' schedules were updated to be within King Saud University Medical City (KSUMC) services. Nonetheless, interns were precautionary banned from entering emergency departments and isolation areas. Also, interns who in the last eight weeks visited any city or country that reported COVID-19 cases or developed symptoms suspecting COVID-19 were asked to declare or self-report to the ETU. Finally, some cycles were switched to virtual platforms or were conducted remotely. Interns kept up with regular meetings, discussed clinical cases, and presented through virtual platforms. As a result, training hours were not significantly affected, especially that KSU PharmD curriculum internship exceeds the accreditation requirement.

5. Transitions in assessment

Beside teaching and training, assessment carried a great deal of challenge after the sudden switch from traditional to virtual education. Based on the aforementioned MOE guidance, many methods of assessment were adopted and suggested, such as open book exam, portfolio, online multiple-choice questions, assignment, online presentation, mini-projects, and discussion board (MOE, 2020b). Our college also applied more interactive methods of assessments, including reflections to specified classes where each student gave feedback on what he or she had learned, liked, disliked, and how to apply what was learned in practice. This method is expected to encourage students as well as faculty members to engage in the class in order to improve teaching and learning quality.

Regarding final exams, the College Council approved online exams on Blackboard only. Although students were given two hours to finish a one-hour long exam, they still had to comply with the university's regulation that they will not be allowed to log in the exam after 30 min. The university also changed the grading system from traditional grading to a pass-or-fail system. Furthermore, due to the emotional stress students may encounter during the pandemic, the College Council made all exams not cumulative where the material covered represents only 20% of the material taught. The rest 80% were assessed using the alternative assessment methods mentioned earlier.

6. Transitions in extracurricular activity and student support

Although students' clubs successfully conducted virtual activities and events, the annual College of Pharmacy Research Day had to be postponed due to the pandemic. Since 2011, this event has been held usually around April every year for undergraduate and graduate students to present their research projects. Albeit, students were still asked to submit their abstract to the research committee to evaluate their projects and will be invited to present their projects in the following year.

On a different note, Academic Advising is ongoing in our college. During the lockdown, the Vice Dean for Academic and Educational Affairs assigned staff to communicate with students and solve any problem they encounter. Moreover, the college designated a WhatsApp account to establish hotline communication with students,

where they can send messages anytime, and any issue was resolved within 24 h. Emails and direct phone communication to the Dean and Vice Deans were always welcome as well.

Last but not least, every year, the college organizes a cozy graduation ceremony aside from the annual convocation the university holds. As anticipated, both events were canceled due to lockdown. Therefore, the college decided to celebrate our graduates in a unique way. First, the graduates and the Dean recorded taking the College of Pharmacy graduation oath from home and published the video online (Youtube, 2020b). Second, the college surprised all the graduates by sending each one of them a graduation cake with a congratulation card from the Dean. This small gesture was well received by the graduates and their families.

7. Lessons learned

Undoubtedly, university education will not be the same after the COVID-19 pandemic passes (Witze, 2020). Virtual education has become the new norm, but understanding students' needs from distance will be a challenge. Therefore, faculties will need to acquire new tools and techniques to engage students. Similarly, the traditional assessment method that only focuses on the exams must be revised.

University closure and sudden turn to virtual teaching worldwide have highlighted many conceptual, educational, and technical gaps. Each university within an educational system reacted within its constraints. Pharmacy colleges in Saudi universities were no exception. Although it may not be completely possible to copy a college's experience, we are sharing ours with an understanding that a framework can be drawn and applied by the other Saudi colleges.

Being part of KSU, our college was supported with multiple enablers that facilitated such a quick transition in educational style. KSU has invested generously in the electronic Learning Management System. For instance, whether used by an instructor or not, all registered students were automatically synchronized in Blackboard and their records were accessible to the instructor. Moreover, KSU has subscribed to many software and platforms that provided alternative or complementary virtual classes and meeting options such as MS Teams and Zoom. Furthermore, the Deanship of e-Transactions and Communication has increased its technical support capacity to compensate for the suddenly massive demand from e-learning users. At the college's level, faculty cooperation was phenomenal. As soon as the College Council enforced Blackboard for teaching and assessment, faculties complied with that sudden switch. Also, many faculties volunteered in the college's tech-support team to help their colleagues over. It is worth noting that a number of instructors have been using Blackboard for assessment and material sharing with students before the pandemic existed. This enabled quick sharing of knowledge among colleagues. On a side note, the management system enforced by academic accreditations participated indirectly to facilitate such a quick educational transition. Beside the ISO 9001 certification, the College of Pharmacy at KSU obtained accreditations and certifications for the undergraduate program from the Canadian Council for Accreditation of Pharmacy Programs (CCAPP), the Accreditation Council for Pharmacy Education (ACPE), the National Center for Academic Accreditation and Evaluation (NCAAA), and the American Society of Health System Pharmacists (ASHP) for the residency program. The positive impact of accreditations fulfillment allowed harmonized and nearly unified teaching, training, and assessment with high quality. Furthermore, the Saudi Pharmaceutical Society (SPS) is nested within the College of Pharmacy at KSU. This enabled our students and faculty to be immediately aware and participating in SPS activities, which included important

mini virtual conferences organized by SPS concerning Pharmacy Education during COVID-19 pandemic.

Apparently, challenges still exist despite the aforementioned enablers and strength points. Although we carefully planned and implemented our measures, we faced unanticipated hurdles. Blackboard downtime was longer than expected, especially during peak synchronized teaching periods. Therefore, the College Council instructed all departments to gather recorded lectures and share them with students via One Drive-based links since KSU has already provided each faculty member with one-terabyte storage size. Moreover, the Vice Dean for Academic and Educational Affairs has been submitting weekly follow-up reports to the Dean. This process accelerated the resolution of conflicts or misunderstandings when applying the newly enforced assessment methods. It was also an opportunity to revise and update our teaching and assessment policies and procedures.

Our college is associated with King Saud University Medical City (KSUMC), which fairly secured the integrity of our APPE training. This association is a major strength point not every national pharmacy college got privileged with. Nonetheless, we had to embrace weekly updates from KSUMC management on interns' permission to the hospital. Moreover, some hospital staff were too busy to dedicate time to supervise or train interns. And to add insult to injury, some interns faced family pressure to refrain from coming to the hospital. As we believed that Pharmacy interns are part of healthcare team and to assure that all interns provide the health care services during this outbreak with full safety precautionary we asked all preceptors in KSUMC to provide as many online clinical training and case discussions as possible to cover all learning objectives

We believe that COVID-19 has impacted Pharmacy Education worldwide. Many pharmacy colleges can relate to the challenges we experienced and speak to the opportunities we expose. We anticipate a paradigm shift in Pharmacy Education where global critical transitions, such as social distancing, will dictate. With the unprecedented dependence on online services, simulation has never been closer to the real world and pharmacy curricula must live up to the new-norm expectation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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