RESEARCH ARTICLE

A SWOC analysis on the impact of COVID-19 through pharmacy student leaders' perspectives

Hend Al-Naimi, Bassant Elkattan, Hiba Mohammed, Laila Shafei, Marwa Elshazly, Alla El-Awaisi ⓘD

College of Pharmacy, QU Health, Qatar University, Doha, Qatar

Correspondence
Dr Alla El-Awaisi
College of Pharmacy
QU Health
Qatar University
Doha
Qatar
elawaisi@qu.edu.qa

Abstract
The COVID-19 pandemic has caused disruptions in many aspects of life across the globe including education provision. This pandemic led to major and rapid restructuring of curricula and assessments as student suddenly moved to unfamiliar learning environment. Active involvement of students in the education process and curricula reform is encouraged. This paper aimed to explore pharmacy student leaders' perspectives related to their learning during COVID-19 pandemic in terms of strengths, weakness, opportunities, challenges and recommendations to move forward. A meeting with pharmacy student leaders was convened. Each student leader individually reflected on their experiences using a structured SWOC (Strengths, Weaknesses, Opportunities, Challenges) framework which was then used to guide discussion. Each student then rated anonymously the importance and the probability of the themes to come up with overall score. Online learning came with both negative and positive aspects from the students' point of view. Despite the efforts that were made by the college and students to adapt to the new educational system, there were drawbacks that may have affected the quality of the education. However, during these unprecedented circumstances, the pandemic has given pharmacy students plenty of opportunities that could positively affect their future career and the delivery of pharmacy education. Pharmacy programmes need to implement strategies within their programmes about disaster preparedness and build student resilience and wellbeing.

Introduction

The COVID-19 pandemic has caused disruptions in many aspects of life across the globe, including education provision. The pandemic has led to worldwide closures of institutions, including higher education institutions which have impacted over 60% of the world's student population. Several countries have implemented localised closures impacting millions of additional learners (UNESCO, 2020). The effects of the pandemic are far-reaching, and while it has affected education globally, the literature that explores the impact of the closures is still scarce because this is a recent situation that has not been properly investigated. This is further complicated by the unique nature of health education programmes. Major and rapid restructuring of curricula and assessments, postponement of experiential placement including overseas electives, fear of graduation delay, and fairness of the process were among the challenges faced by students as they suddenly moved to an unfamiliar learning environment (Byrne, Gavin & McNicholas, 2020; Harvey, 2020). Pharmacy schools worldwide tend to implement curricula changes and major teaching delivery initiatives

gradually, following long term planning and structured implementation processes following best practices (Lyons, Christopoulos & Brock, 2020). However, the COVID-19 pandemic challenged these traditional approaches as many educators were faced with switching their teaching to online platforms at short notice with limited access to evidence-based practices for online delivery.

In general, available evidence suggests that pharmacy and healthcare students, such as medical, nursing, and dental students, tend to suffer from stress and burnout in normal educational circumstances (Beck 1995; Dyrbye *et al.*, 2008; Marshall *et al.*, 2008; Campos *et al.*, 2012). It is anticipated that the transition from class-based teaching to online teaching can contribute an additional stressor on the student. Medical students reportedly experienced increased anxiety and concerns about COVID-19. While the impact of the COVID-19 pandemic on medical students has been explored in the literature, pharmacy students' perspectives and experiences have been scarce in the literature (Byrne, Gavin & McNicholas, 2020; Chandratre, 2020; Wong, 2020). Furthermore, many still do not consider pharmacists as frontline workers, although they are the most accessible healthcare professionals and continue to provide direct patient care during the pandemic (Elbeddini *et al.*, 2020).

The Qatar University College of Pharmacy (CPH) was established in 2007 and is the only pharmacy programme in the country and the first programme outside of Canada to receive full accreditation from the Canadian Council for Accreditation of Pharmacy Programmes. The college offers four programmes: Bachelor of Science (B.Sc.), Master of Science (M.Sc.), Doctor of Philosophy (Ph.D.), and Doctor of Pharmacy (Pharm.D.). The current model for undergraduate pharmacy education consists of a five-year B.Sc. (Pharm) and educational outcomes are based on the Association of Faculties of Pharmacy of Canada (AFPC) guidelines.

Following a statement issued by the Government Communications Office, Qatar University suspended classes in public and private schools and universities for all students in the State of Qatar from 10th March 2020 until further notice. Fortunately, since 2008, the College of Pharmacy lecturers captured all the pharmacy scheduled lectures across the four professional years using the Echo360 media platform. All links to recorded lectures are posted on Blackboard and are available to students throughout the semester. The links are then archived but remain accessible for students and faculty (Wilbur & Jewesson, 2010). Therefore, at the start of the suspension of classes, students were referred to recorded lectures offered in the previous years if deemed appropriate.

Furthermore, the college had also been delivering blended learning experiences as part of bridging courses for the part-time Pharm.D. programme, where students accessed archived lectures at their convenience with synchronous exercises incorporated and monthly visits to campus by students to complement the online learning (Wilbur, 2016).

Upon the suspension of classes, the Qatar University Centre for Excellence in Teaching and Learning (CETL) offered intensive training sessions and developed a website that included instructional material to provide guidance to faculty members on the different technologies available. The university also created a website for all COVID-19 related announcements and information. Furthermore, a committee was formed, which included the Dean, the Associate Dean for Academic Affairs, the Assistant Dean for Student Affairs, and all Department Heads, to regularly discuss plans and address any arising issues. Additionally, the committee ensured an effective fair plan for assessment is in place in line with the university guidelines.

The current curriculum centred on face-to-face learning, however, the unprecedented measures caused by COVID-19 led to drastic and sudden changes to the education process in March. Faculty too had to adopt teaching methodologies that were more suitable for online learning within a short time frame. Although lecture-based teaching has easily transitioned to online platforms, the interactive nature of many of the CPH courses, focused on the development of professional skills including problem-based learning, interactive student discussions, role play, simulated patient interaction, research courses, pharmaceutical experiments, and experiential learning, required alterations. Faculty utilised various online platforms, including Blackboard Collaborate Ultra, Cisco Webex meetings, Microsoft Teams, and Zoom. These changes affected students, as this was a new approach to education that they had never experienced, and they had to adapt promptly because of the unique workload of pharmacy students.

A lack of transparency and limited communication, especially during pandemics, can lead to significant disruption to the student educational experience (Harvey, 2020). Active involvement of students in the education process and curricula reform is encouraged (Brooman, Darwent & Pimor, 2015). Therefore, it is of paramount importance to provide students with opportunities to have a voice in issues affecting them in their education and to influence decision-making processes (Bron & Veugelers, 2014). This will lead to tangible benefits for students who will be more responsible, accountable, have

better control over the learning process, and lead to changes that are of relevance to students (Brooman, Darwent, & Pimor, 2015). As such, this paper aimed to explore pharmacy student leaders' perspectives related to their learning during the COVID-19 pandemic in terms of strengths, weakness, opportunities, challenges, and recommendations to move forward.

Methods

A qualitative descriptive methodology was adopted in order to explore the current strengths, weaknesses, opportunities, and challenges (SWOC). A SWOC analysis was chosen to strategically evaluate the online learning experience for pharmacy students at CPH and to identify the opportunities that could arise from the crisis. The SWOC analysis is a well-known tool for analysing the strategies which aim to highlight the factors that affect the institution's success and to mitigate the risks during and after the pandemic (Aithal & Kumar, 2015). SWOC analysis design was adopted due to its ability to explore and generate a systemic approach of strategies for enhancing the pharmacy students' experience (Gürel & Tat, 2017).

Five students representing each of the different professional years in pharmacy, including the president of Qatar pharmacy undergraduate society (QPhUS), were invited by the senior author to participate in the SWOC analysis. These students are elected members of QPhUS and are also members of the CPH undergraduate student advisory committee which is a forum to discuss with CPH administration any issues related to students' academic and non-academic experiences in terms of strengths and

area for improvements. These members also take an active role in leading students' initiatives in hosting academic and non-academic outreach and social events. The five students were recruited to participate in this study as they are considered a focal point between the students and the CPH administration. Hence, when each student reflected on the experience, it was not a personal experience but rather their classes experience during the pandemic.

The senior author met with the student leaders to discuss the study design and the plan for the SWOC analysis. Each representative then reflected individually on the SWOC components to ensure different experiences of students across the various professional years were captured and represented in the analysis. The members then met to discuss their perspectives on the different SWOC components and took note of emerging themes. The discussion was recorded with notes taken during the meeting. The final themes were reviewed and discussed with the senior author.

Using Google forms, each member anonymously rated the importance and the probability of the themes. The importance score depends on the total number of each theme under the categories (strengths, weaknesses, opportunities, and challenges). The probability would range from one to three, with three being very likely to occur and one being unlikely to occur. The final score of the themes was based on both assigned values which were multiplied, and this would then reflect the potential outcome and its chance of occurring. Final scores were combined from each participant to prioritise the themes (LaConte, 2017). Suggestions and recommendations of

Table I: Results of SWOC analysis

Strengths			Weaknesses		
Rank	**Theme**	**Score**	**Rank**	**Theme**	**Score**
1	Self-directed learning	0.67	1	Study load	0.69
2	Time management	0.56	2	Unsuitability of certain courses for online learning	0.66
2	University support	0.56	3	Assessment uncertainty	0.52
3	College readiness	0.53	4	Limited engagement	0.38
4	Flipped class approach	0.37	5	Lack of motivation	0.34
5	Efficient communication	0.33			

Opportunities			Challenges		
Rank	**Theme**	**Score**	**Rank**	**Theme**	**Score**
1	Expansion of student experiences: telepharmacy	0.78	1	Summer experiential learning postponement	0.82
2	Readiness and adaptability to future online learning	0.64	2	Impact of online learning on student mental and wellbeing	0.71
3	More student collaboration nationally & internationally	0.49	3	Quality of practical learning	0.66
4	Research	0.43	4	Equity of learning experience	0.59
5	COVID-19 national volunteering campaign	0.42	5	Post-graduation licensing exam	0.54
			6	Extracurricular activities	0.44

ways to move forward were generated through discussion with team members. Ethics approval and consent to participate was not applicable as students involved in this research were not participants but investigators.

Results

In this section, the SWOC analysis is presented in a narrative format. Key themes derived from the analysis are presented in Table I.

Strengths

Self-directed learning at CPH was rated as the most significant strength with a score of 0.67. This was because the students had a better opportunity to fully understand and apply what they learned. Both time management and university support weighed a score of 0.56, falling in the second-highest ranking. With a difference of only 0.03, college readiness was rated as the third significant strength. Other identified strengths were the flipped class approach and efficient communication, scoring 0.37 and 0.33, respectively. There were different probability ratings under the flipped class approach by each team member. This might be secondary to the difference of professional year background each team member had and their experiences with the flipped class approach during spring 2020, while the efficient communication showed differences in both the probability and importance reflecting each professional year and their experiences.

Weaknesses

Based on the calculations of the theme's rating, the college's study load was deemed to be the most significant, with a weighted score of 0.69. Most students in the college take an average of nine to 11 courses per semester, and upon the suspension of classes, most of the assessments in the courses were converted into assignments which increased the workload. This was followed closely by the unsuitability of certain CPH courses for online delivery. These were mostly courses that included mathematical calculations like pharmaco-kinetics, pharmaceutics, and therapeutic drug monitoring (TDM) with a score of 0.66. The small variation between the two aforementioned themes may be due to the fact that all students found the study load to be a more probable internal factor to be encountered, as all five students gave it a score of three in the probability domain. Moreover, students in the first and second professional year were more exposed to this weakness as they have a larger number of these courses in comparison to the other professional years. The third most important weakness

was ranked to be the uncertainty of assessment methods that were going to be used by the college. This factor was calculated to have a weighted score of 0.52. Limited engagement was given a score of 0.38, due to the nature of online delivery and the lack of direct face to face contact with other students and instructors. This factor was closely followed by the lowest ranking weakness, which was a lack of motivation with a score of 0.34.

Opportunities

The most highlighted opportunity was expanding students' learning experience by introducing the concept of telepharmacy with a score of 0.78. Graduating students and Pharm.D. students were able to give distance pharmaceutical care to simulated patients through virtual Objective Structured Clinical Examination (OSCE) (Gulf Times, 2020). Then, readiness and adaptability to future learning came close in second place with a score of 0.64. In the third ranking, more collaborations nationally and internationally took place with a score of 0.49. This was because of the ability of the Qatar pharmacy undergraduate students' association (QPhUS), which is part of the International Pharmaceutical Students Federation, to collaborate and engage with several pharmacy student associations outside Qatar, including Canada, Pakistan, Lebanon, and Palestine. For example, a virtual webinar entitled: 'COVID-19 Creating Opportunities from a Crisis for Pharmacy Students: Discussion from Around the Globe' was held (Tribune News Network, 2020). Moreover, pharmacy students in Qatar had the opportunity to participate in virtual debates and competitions that were held by the inter-professional student association (IPE) in Qatar. Research was ranked in fourth place with a weighted score of 0.43. The lower ranking might have occurred because not all professional years undergo research as a part of their curriculum. However, in the case of some senior students, the summer break was an opportunity to work on publishing their capstone projects. Furthermore, Qatar university offered many research internships online to benefit students. Lastly, with a 0.01 difference only from the fourth ranking score, came the COVID-19 national volunteering campaigns as the least important opportunity in the SWOC analysis. This campaign was announced by the Ministry of Public Health (MOPH) to get volunteers, including CPH students, to participate in the ministry sectors for raising awareness about COVID-19. The campaign guaranteed a new experience for CPH students who volunteered and added up to their knowledge.

Challenges

The first challenge highlighted was the postponement of the summer experiential learning, as many second- and third-year students were unable to pursue their scheduled rotations. The second rated challenge, with a total of 0.71, was the impact of online learning on students' mental health and wellbeing. The students, regardless of their professional year, experienced episodes of burnout that may have affected their academic performance. Ranked as the third challenge was the quality of practical learning with a total of 0.66. Part of the CPH curriculum were courses such as the professional skills lab which requires student engagement and exercising interpersonal communication with patients, families, and healthcare professionals, as it is based on translating the knowledge they have acquired into skills related to various processes in pharmaceutical care, medication prescribing, and dispensing. Furthermore, the curriculum included pharmaceutical science labs which are based on hands-on experiments. This was followed by the inequity of learning with a score of 0.59 as some students had issues with access to online platforms, either due to internet connectivity or lack of available personal laptops at home. Post-graduation licensing exams were rated as the fifth significant challenge with a total score of 0.54 since 2020-graduates were unable to take their licensing exam as per schedule. The challenges were not only confined to the academic aspect of student life because extra-curricular activities were affected as well. The cancellation of extracurricular activities involving the pharmacy student body (QPhUS) was rated as the fifth challenge with a total of 0.44.

Moving forward

Through this SWOC analysis, students made a number of recommendations and suggestions to move forward. These include the need to introduce disaster prepared-ness into the curriculum. Depending on the course type, some might utilise the assignments-based approach while others might be assessed through examinations. There is no doubt that with online learning, the nature of delivery would change; hence, course coordinators should plan according to the course's nature. For example, courses that involve pharmacokinetics and pharmaceutical calculations should utilise the usage of whiteboards because visual learning is important for students to comprehend the concepts. Courses that utilise cases and research papers can use a flipped class learning approach, in which, prior to the class session, students are divided

into groups and are given the topic. As for practical learning that involves patient counselling and experiential learning, it is inevitable that learning may be compromised since the nature of such learning is optimal through face-to-face communication. However, these courses can utilise technology-trained, simulated patients to ensure that the objectives of the programme, in terms of patient care, are met. Furthermore, the introduction of the telepharmacy approach should not be ignored and should continue to be part of pharmacy education. For example, through engaging students in virtual rounds, medication counselling via phone, and even remote electronic medication record documentation.

Finally, the pandemic has not only affected the academic aspect of students' life but also their mental health. The long-term effects are yet to be explored, however, to lessen the impact of both a pandemic and a change in the educational environment, it has been recommended that students should be offered both academic and mental health support by professionals.

Discussion

The looming effect of the virus still hangs over the world, and countries are prepared to go back into lockdown if there are peaks in community outbreaks. To the authors' knowledge, this paper is the first in the Middle East to report pharmacy student leaders' perceptions of areas of strengths, weaknesses, opportunities, and challenges as they pertain to the switch to online learning due to the COVID-19 pandemic and the unprecedented circumstances the whole world is under. The SWOC analysis found that students perceived self-directed learning and their ability to manage their learning in the comfort of their own home, without the need to worry about time spent commuting to university, as a strength. On the one hand, this is contrary to findings from the United States of America (USA) where self-directed learning was perceived as a struggle for the students during remote learning (Fuller et al., 2020). On the other hand, the results have shown that the most prominent weaknesses of distance learning were the study load due to the conversion of assessments to assignments and the limited available time in the semester which increased the workload. Furthermore, the limited experience of developing open-book exams for faculty and sitting the exam for students have been suggested to provoke anxiety amongst students not used to this style of exams (Jervis & Brown, 2020).

Despite faculty members' efforts to provide students with various opportunities to remain interactive online, limited engagement and lack of motivation occurred, as it was challenging for students to focus on online lectures for two to three hours and to continue to engage with faculty members in the absence of face-to-face interaction due to 'zoom fatigue'. This is similar to the experience of students in Harvard school of dental medicine who perceived the virtual learning live lecture synchronous approach to increase burnout and decrease student retention and engagement with course content (Chen, Kaczmarek, & Ohyama, 2020). Therefore, it is of crucial importance to provide students with the opportunity to share their opinions and voice their concerns which has been perceived as an important driver for student engagement (Senior et al., 2018). The CPH administration met with student leaders several times during the spring semester 2020. Furthermore, a survey was sent to all students, which focused on their experiences of the different online platforms, what is working well with online learning, and the improvements needed to enhance the learning experience.

The SWOC analysis demonstrated that the nurtured culture of volunteering within the healthcare system was perceived as an opportunity that presented itself as a result of the pandemic. The positive outlook on volunteering is consistent with findings of a cross-sectional survey of medical students which highlighted that 59% of students motivated by altruism would volunteer in an infectious epidemic (Gouda et al., 2019). However, only 4% of 274 students who participated in a survey felt they are prepared for such settings and, hence, it has been argued that the participation of medical students as volunteers might lead to unnecessary risks to themselves, patients, and other healthcare professionals (Gouda et al., 2019; Byrne, Gavin, & McNicholas, 2020). These discussions raise questions on the balance between risks and benefits in recruiting healthcare students as volunteers (Byrne, Gavin, & McNicholas, 2020). Qatar has called on all students in the healthcare field to volunteer, but this involved low risks areas such as guideline and strategies development, contact tracing, and referral call centres. Thus, students in this SWOC analysis felt a sense of moral obligation and discussed that the volunteering implemented in Qatar involved fewer risks to patients and students alike. It also aided in understanding pandemic preparedness, how to utilise their skills and participate in healthcare provision, and the roles they can play during disasters. As for the future of the curricula, this pandemic has warranted changes such as the inclusion of suitable approaches for pandemic and disaster preparedness (Byrne, Gavin, & McNicholas, 2020).

Distance learning procured some external challenges. Students rated the most challenging consequence of the pandemic to be the delay of summer experiential placements. Similarly, students at the University of North Texas System College of Pharmacy raised concerns about postponing the rotations and the anxiety that students will experience when starting their rotations during the pandemic (Muilenburg, 2020). As a solution to these challenges, pharmacy schools in the USA ensured that their students achieved their required Advanced Pharmacy Practice Experiences (APPE) hours through curriculum modifications and delaying the rotations. However, implementing the aforementioned strategies at CPH may undermine students' competencies that are earned through traditional experiential learning. Therefore, faculty and professionals must determine methods through which professional learning is not disrupted to ensure students are training in environments that accurately reflect clinical practice.

In terms of preclinical and clinical experience, the pandemic impeded the educational modules and systems that require human interaction, as any sessions that depend on group interactions and clinical scenarios cannot be easily simulated and require a lot of trial and error (Byrne, Gavin, & McNicholas, 2020). A cross-sectional-based questionnaire study was done in Saudi Arabia to explore the impact of the COVID-19 lockdown on pharmacy education (Alqurshi, 2020). Reported challenges were similar to the authors' study, which include the lack of student-student and student-teacher interaction, difficulty to deliver some concepts online, and the shift to remote assessment. However, it was found that remote learning implemented a positive effect on the students' skills. Technology incorporated various methods of teaching, such as flipped classrooms and problem-based learning, which propel the students to be independent lifelong learners, which was similar to CPH's approach.

Continuing distance learning unleashed another challenge. According to reported challenges, students' mental health and wellbeing have been negatively impacted. Students at the College of Pharmacy were not the only cohort to experience such a psychological impact, as a study in Changzhi Medical College found that 24.9% of the 7143 medical students experienced anxiety during the COVID-19 pandemic (Cao et al., 2020). While surveys on the impact of the pandemic on pharmacy students' mental health specifically have not been published, the response to these changes would not differ, and these responses are largely biological and do not discriminate (Schlesselman, Cain, & DiVall, 2020).

Despite the pressure and the unprecedented circumstances, students and faculty alike displayed remarkable resilience and responsibility in transitioning to online learning. The pandemic has given pharmacy students plenty of opportunities to develop and experience resilience and grit, concepts which need to be developed and experienced rather than taught (Stone & Pate, 2020). A coping reservoir has been proposed as a conceptual dynamic model, focusing on factors related to the student experience that can either replenish the reservoir, leading to resilience and wellbeing, or drain it, resulting in burnout and distress (Dunn, Iglewicz, & Moutier, 2008). It is argued that students who do not possess attributes of resilience may struggle to deal with difficulties and negative experiences they face later on in their career. There is a call for medical and health programmes to focus on developing positive inputs during the student journey to enhance their resilience and coping strategies (Dunn, Iglewicz, & Moutier, 2008; Stoffel & Cain, 2018). Therefore, providing support and developing protective factors to enhance student wellbeing during the pandemic should be a priority of medical and healthcare programmes (Schlesselman, Cain, & DiVall, 2020).

Limitations

The study presented some limitations that may have occurred due to the time constraints, as researchers were eager to complete the study and provide a snapshot of student leaders perspective so recommendation could be utilised in advancing the pharmacy education experience in CPH. Although all professional years were represented in the team, there was an absence of the pre-pharmacy and postgraduate students who might have provided a wider perspective for the pharmacy education in general. Furthermore, the analysis was done by only five students, which might have resulted in the absence of other students' opinions. However, all student researchers are elected members of the pharmacy student association who took into account their classmates' individual experiences and, therefore, can be considered as representatives of the students' perspectives in general. Further analysis might include surveys and focus groups for exploring the students' perspectives in more detail.

Conclusion

In this research, the effect of the COVID-19 pandemic on pharmacy education in Qatar's university education was investigated. Through this analysis, time management and

the opportunity for self-directed learning were shown to be the highest-ranking strengths. All weaknesses identified were resulting from the sudden change of the education system, and the unsuitability of certain courses for online learning and the study load of pharmacy education were the most important weaknesses. Challenges that should be addressed were the effect of such changes on the wellbeing of the students and the postponement of experiential training. The unprecedented circumstances have presented opportunities that could positively affect pharmacy education in the future, such as the introduction of the telepharmacy approach, disaster preparedness, and the enhanced readiness of the CPH members to adapt to online or blended learning. Pharmacy programmes need to implement strategies within their programmes to enhance student resilience and wellbeing.

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