Pharmacy Students Perceptions of Their Distance Online Learning Experience During the COVID-19 Pandemic: A Cross-Sectional Survey Study

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ABSTRACT

INTRODUCTION: The COVID-19 pandemic imposed dramatic changes on educational practices worldwide. Many universities and schools have moved into the delivery of their courses and educational programs utilizing fully electronic online modes. This study aims to evaluate the pharmacy student distance online learning experience during the COVID-19 pandemic.

METHODS: A cross-sectional survey was utilized where a 3-domain survey questionnaire focused on preparedness, attitude and barriers was distributed to students at the time of conclusion of the semester. Each domain consists of multiple questions that made up a score that reflects their preparedness, attitude as well as barriers relevant to distance online learning experience. The survey was voluntarily, and all data were collected and recorded via google forms with maintaining anonymity.

RESULTS: The response rate was about 75% (n = 309). The results’ analysis revealed no gender differences in any of these domains. However, there were some variable responses among different educational levels. The average preparedness score was 32.8 ± 7.2 (Max 45), the average attitude score was 66.8 ± 16.6 (Max 105), and the average barrier score was 43.6 ± 12.0 (Max 75). There was statistical significance difference in both preparedness score and attitude scores between different professional years (P-value <.05). However, there was no difference in barrier scores among all professional years. The results indicated that about 61.4% of the students agreed on that college of pharmacy was well-prepared and ready for the online education during the emerging COVID-19 pandemic with complete transition into online education. The results also indicated that 49.2% of the students showed positive attitude toward the provided online learning. The results indicated that about 34% of the students identify some barriers toward the provided online learning. Finally, there were strong association between the need for training on how to receive online courses and preparedness and barriers scores.

DISCUSSION AND CONCLUSION: E-learning experience pose challenges and presents opportunities during emergency situations. The need for training for students and faculty was highly associated with the preparedness and barriers domains rather than the infrastructure or computer literacy, so the school can improve their experience by addressing these needs.

KEYWORDS: E-learning, COVID-19, pharmacy, preparedness, attitude, barriers, online learning

Introduction

Most of the academic institutions including medical and pharmacy schools around the world have adopted some forms of electronic learning many years ago as supportive and efficient tool to their face-to-face classes and as flexible method to submit students assignments and conducts exams, with comparable quality to traditional learning but at lower costs and higher convenience for students and instructors.1-4

The current Coronavirus disease for 2019 (COVID-19) pandemic situation caused to massive and rapid spread of the novel Severe Acute Respiratory Syndrome–Coronavirus 2 (SARS-COV-2) virus worldwide has disrupted many sectors including education.5 According to the United Nations Educational, Scientific and Cultural Organization (UNESCO) most recent reports, more than 120 countries have closed their educational institutions and suspended physical classes on
campus in response to health authorities’ advise and/or mandate that come in recognition of the crucial role of social distancing and programmed lock-downs in minimizing the spread of the virus among community members. Globally, these closures impacted more than 60% of the students at different educational levels.6 Almost all countries have transitioned their courses and teaching programs delivery to a fully distance online learning mode.

Pharmacy and other health professions educations rely on different traditional and student-centered teaching methodologies involving didactic lectures and seminars, experiential and practical training, and laboratory sessions, as well as team and problem-based techniques such as small group discussions.7-10 Didactic lectures can be conducted in either a traditional classroom way (face-to-face learning) or through the virtual online learning, if it is the only available method of teaching, that is, when academic institutions shift to virtual platforms exclusively. The quality is expected to be comparable and the attainment of learning outcomes is not expected to be compromised. However, other teaching and learning activities cannot meet their learning outcomes without an effective physical, and social, interaction between the instructor and learners and between learners themselves.11

During the pandemic, instructors and teaching staff were required to adapt quickly to the rapid transition in the education process and depend completely on the online platforms available to them, to deliver their courses, exams, and other required teaching and learning activities. While rapid transition to distance online learning was a mandatory and necessary action to ensure the learning continuity during the COVID-19 pandemic, it was not always a smooth process, that posed many challenges for instructors, learners, and their families.5,12 The impact on student’s mental health, lack of motivation by learners, difficulty in adapting to distance online learning methods, technical and bandwidth problems, and content creation of distance online learning materials for didactic and, especially, practical and laboratory-based courses were among the main challenges encountered.13 Other challenges include the economic impact on families and the immediate and high demand for training and IT support.14

The Pharm.D. program at College of Pharmacy (COP) at King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS) is nationally accredited and was established by implementing an ACPE-accredited pharmacy program.15 The is steadily evolving to accommodate emerging local needs and new national and international professional trends. In addition, the program thrives to improve its pedagogical approaches maintain the quality of the learning process. Students’ evaluation of their courses and the teaching process can provide direct and indirect quality indicators and is a conduit for constructive feedback for program administrators and faculty. Analysis of evaluation results are used in the continuous quality enhancement of the program. This study aims to obtain pharmacy students feedback to assess their attitude, their perceived preparedness and the perceived barriers to the transition to distance online learning imposed by the COVID-19 pandemic.

Methodology and Settings

Rationale

The authors emphasize that this is an investigation of a distance online learning experience in which course design and delivery that was intentionally designed based on online instructional design strategy, rather, it was planned and implemented in a crisis and risk management mode to mitigate the negative effects of the COVID-19 pandemic.14 Consequently, the choice to investigate student attitudes and perceptions, although seems subjective, it is of prime importance to evaluate the experience under these circumstances, which shared by many institutions and programs around the globe. These works will a more comprehensive look at the distance online learning experience of students and faculty as this mode of delivery is going to become the new norm, at least partially.

Backboard and Backboard Collaborate® have been used for all teaching sessions and examinations. Zoom® was used for interactive and discussion sessions. Instructional materials were delivered, both synchronously and asynchronously.

Study design

The data for this study were based on students’ experiences during the period they were involved in distance online learning offered by the College of Pharmacy at KSAU-HS. The transition to distance online learning was in response to whole country lockdown similar to all countries in the world and the region. During that period, lectures, seminars, and examination were conducted form distance by online methods and virtual platforms. These educational activities were planned to be carried out in shorter than planned in the regular semester. The changes were communicated to all students ahead of time, that included but not limited to scheduling, assessment, grade distribution, as well as addition or deletion of educational activities. All activities that need physical presence were suspended and each course had an action plan with significant details for all further requirement. Online learning was a mixture of live online sessions, recorded lectures, online live discussions, and presentations. These were several short online exams for each course as well as pre-announced course related assignments. There was full technical support available for faculty and students throughout the pandemic lockdown period. The college administration maintained all strings attached between faculty, students, and the administrative assistants and closely monitored all educational activities. The experience was fully discussed among the faculty with the dean, associate deans for student and academic affairs in both males and female campuses, associate dean for clinical training, department’s chairman,
as well as faculty. All changes in each course were documented in compliance to quality assurance standards that maintains the compliance with program learning outcome and course learning outcomes.

Students participants were asked to complete an online self-reporting questionnaire to facilitate the distribution process and increase efficiency of data collection. Participants were sent individualized emails that included a link to the questionnaire and a statement informing that participation is important, but at the same time is completely and that their identities will stay anonymous to the research team to maintain privacy and that their responses will be strictly confidential. Detailed information about the purpose of the study, risks, and benefits were included in the informed consent form that was attached in the first page of the survey.

Sample and setting

The study sample included all professional pharmacy students from both genders and the 5-year levels (Professional years 1, 2, 3, and 4 and pre-professional year 2) who are currently enrolled, as of academic year 2019-2020, at College of Pharmacy at KSAU-HS, Riyadh, Saudi Arabia. The survey questionnaire was sent to students after the conclusion of the semester and given adequate time to respond.

Questionnaire design

The survey contained questions on demographics, preparedness, attitudes toward online education, prior experience, and barriers to use online education tools. The survey was designed by the investigators as the items were developed after an extensive review of the literature and previously validated scales; besides, some items were developed based on qualitative information collected during a pilot testing stage. The validation and reliability of the final survey was not performed.

The final questionnaire consisted of 3 major domains; the students’ preparedness domain, attitudes domain and barriers to online learning domain. Likert scale-based questions were used to assess the 3 major domains with total number of 9 questions to assess the preparedness domain, 21 questions to assess the attitudes domain and 15 questions to assess the barriers domain. Each answer was given points-based score (strongly disagree = 1 point, disagree = 2, neutral = 3, agree = 4, strongly agree = 5 points) except for some negative questions were the scores are reversed. This leads perfect scores of 45, 105, and 75 for the preparedness, attitude, and barrier domains. The domains and questions in each domain are listed in Table 1.

Preparedness domain questions (total of 9 questions) evaluated if the students were well-prepared to join online learning, and if the university used to support online education before the emerging of COVID-19. Similarly, this domain asked whether online education enabled students to continue their education like the traditional approach. The students’ belief regarding the preparedness of the faculty members toward online learning were collected. Finally, few questions aimed to measure the students’ preparedness for online learning in terms of their background knowledge and technical skills.

Attitude domain questions (total of 21 questions) were more than preparedness questions in order to capture the student experience either positive or negative. The questions included the students’ perception regarding this new experience, quality of the online learning, and willingness to have online learning as a new norm. Also, the psychomotor skills like ease of use and adaptation to new activities such as homework and assignment as well as time management were included in this domain. To avoid survey questions leading answers and to reduce bias, 5 questions were included to evaluate the student’s attitude toward the didactic in-class approach in comparison to online learning approach in terms of preference, efficiency, and workload. The student’s perceptions were measured regarding the new environment settings, virtual communication, and distance interactions. Motivation to register and take online courses were also embedded in 2 questions with an additional question about their attitude toward having all degree course work to be online without any difficulties. Some questions evaluated the student’s attitude toward teamwork possibilities, communication skills improvement, and efficient idea sharing. Finally, a question aimed to measure student’s perception if the online education is fair as an overall experience.

Barriers domain questions (total of 15 questions) addressed the anticipated barriers that might face the students throughout this new emerging experience. These barriers were related to technical related experiences either past experiences or acquired during the pandemic outbreak. The concern was to motivate students to give more attention to the unexpected changes. There were few questions about the content delivery (online vs face-to-face), instructions, communication, and new assessment strategies and schedules. Additional anticipated barriers were also evaluated regarding cost, time, quality, as well as support systems.

The questionnaire also included students’ individualized characteristics such as gender and current year of study at the pharmacy school. Moreover, the questionnaire included questions on prior experience with online learning (eg, attending webinars, receiving and/or giving online courses, online workshops, etc) and areas of developments that students perceive to necessary for engaging in online learning (3 questions). These questions aimed to capture the student experience either positive or negative. The questions asked about there were any need for computer skills literacy, for skills training in using computers and internet, and for training on online course delivery.

Statistical analysis

IBM® SPSS version 24.0 statistical package was utilized for data analysis. Descriptive analysis was carried out using mean
Table 1. Domain, stems, and response statements rated by students in the study survey.

| DOMAIN      | STEM AND RESPONSE STATEMENTS |
|-------------|-------------------------------|
| Preparedness: | In your opinion, what do think about your preparedness toward e-learning: |
|             | I was well-prepared to join online learning |
|             | Before the emerging of COVID-19, the university used to support online education |
|             | After the emerging of COVID-19, the university started supporting online education |
|             | Online education enables students to continue their education similar to the traditional approach |
|             | I believe that faculty members will overcome the challenges of online learning |
|             | I feel comfortable taking online courses |
|             | I feel that my background and experience will facilitate my involvement in online studies |
|             | I have satisfactory computer skills for dealing with online course/assignments |
|             | My school provide adequate hardware and technical support for online learning |
| Attitude:   | In your opinion, what do think about your attitude toward e-learning |
|             | With the existence of online education, pandemic does not disrupt my future plans |
|             | My university delivers a high-quality online learning experience |
|             | I would prefer to have online learning to become the new normal |
|             | I am able to easily access the Internet for my studies |
|             | I feel comfortable to actively communicate with my classmates and instructors online |
|             | I feel that taking courses online will help me to remember/master them better |
|             | Online courses help me assign reading and homework time better than on-campus approach |
|             | I am able to complete assignments on time |
|             | I prefer in-class approach as it provides a lot of interaction with my instructors and students |
|             | I feel more comfortable sharing my thoughts in an online learning environment than in-class |
|             | I can ask my teacher questions and receive a quick response online |
| Barriers:   | In your opinion, the following are real barriers to the e-learning process |
|             | Limited technology experience |
|             | Lack of past experience on using online tools |
|             | Lack of motivation |
|             | Too challenging eLearning materials |
|             | Lack of instructions |
|             | Avoiding commonly used online tools such as YouTube and Facebook by instructors |
|             | Living away from educational institutions |
|             | Inability to networking with expert in the field |
|             | Too challenging eLearning tools |
| Areas of development: | Please indicate your need for the following areas of development necessary for e-learning |
|             | Basic computer literacy course |
|             | Skills training in using computers and the Internet |
|             | Training to help receive your online course |
and SD for quantifiable variables. One-way analysis of variance (ANOVA) was performed to address students’ attitudes toward the online learning at different levels of sociodemographic characteristics. One-way ANOVA was used to find the association between total scores of preparedness, barriers, and attitude with year of the program and Bonferroni post hoc test was used for intergroup comparisons between year of program. Independent samples t-test was used to compare the mean difference between gender and total scores of preparedness, barriers, and attitude. One-way ANOVA was used to find the association between total scores of preparedness, barriers and attitude with the need for a basic computer literacy course, the need for training on computers skills and the use of the internet, and on how to receive online courses. The statistical significance was fixed at P-value less than .05.

Results

Participants’ characteristics

The survey was distributed to 414 pharmacy students, 318 students in the 4 professional years of the program and 96 students in the second pre-professional year. A total of 309 responses from professional and preprofessional pharmacy students were received, that is, the response rate was approximately 75%. Participants characteristics are presented in Table 2. Female students represented 49.8% which is consistent with their overall percentage in the Pharm.D. student’s population (50.8%). The pre-professional year students represented 14.6% of the total participants. Highest number of participants were form the first professional year (30.4%) and the lowest was from forth professional year (12.0%), which roughly correlates to the total number of enrolled students in each of these years. Almost half of the students (48.5%) reported that they have prior experience with online learning such as attending online webinars, receiving online courses, and participating in online workshops.

Preparedness of pharmacy students toward online learning

Preparedness score was calculated from the sum of each question’s answer score (all 9 questions). Average scores ± standard deviations of students’ preparedness level toward online teaching at the pharmacy school are presented in Table 3. The average preparedness score was 32.8 ± 7.2 and 95% confidence interval for Mean (32.0-33.6); that’s around 71.1% to 74.7% of a perfect score of 45.

Preparedness scores for both females and males were almost similar where average females’ score was 33.3 ± 7.3 and average score of 32.3 ± 7.1 for male students. While there was no significant difference in the perceived preparedness level between males and females, 33.3 ± 7.3 and 32.3 ± 7.1, respectively (P = .201), there was statistically significant difference in perceived preparedness score between different professional years (P-value = .001). The lowest preparedness score was among second professional year (P2) students and highest among fourth professional year (P4) students, 30.41 ± 8.2 and 35.0 ± 4.0, respectively. The association between total scores of preparedness and years of program was showed statistically highly significant with an F-value = 3.844 and P-value =.005 (<.01). The inter group mean comparisons between P1 and P4 students showed highly statistically significant difference to P2 students in post hoc Bonferroni test, P-value = .027 and .016, respectively.

Attitudes of pharmacy students toward online learning

Attitude score was calculated from the sum of each question’s answer score (all 21 questions). Average scores ± standard deviations of students’ attitudes level toward online teaching at the pharmacy school are presented in Table 3. The attitude scores ranged from 28 to 105 with an average score of
Table 3. Preparedness, attitudes and barriers perceived by pharmacy students toward online learning.

| VARIABLE                  | CATEGORY  | PREPAREDNESS SCORE* | ATTITUDES SCORE** | BARRIERS***  |
|---------------------------|-----------|---------------------|-------------------|--------------|
|                           |           | AVERAGE ± SD        |                   |              |
| Gender                    | Male      | 32.3 ± 7.2          | 66.1 ± 16.5       | 42.9 ± 12.1  |
|                           | Female    | 33.3 ± 7.3          | 67.5 ± 16.8       | 44.3 ± 12.0  |
| Year of the program       | PP2       | 31.8 ± 6.8          | 63.4 ± 13.7       | 45.2 ± 8.6   |
|                           | P1        | 33.8 ± 6.7          | 70.1 ± 16.6       | 42.1 ± 12.1  |
|                           | P2        | 30.4 ± 8.2          | 61.2 ± 19.3       | 45.2 ± 13.6  |
|                           | P3        | 33.7 ± 7.8          | 67.7 ± 16.0       | 42.2 ± 11.4  |
|                           | P4        | 35.0 ± 7.2          | 72.2 ± 11.2       | 44.3 ± 13.1  |
|                           | Average   | 32.8 ± 7.2†         | 66.8 ± 16.6†      | 43.6 ± 12.0  |

Abbreviations: PP2, Second Pre-Professional Year; P1-P4, Professional Years 1-4.

*Preparedness Score: Score made up of the average answers for 9 preparedness questions. The answers ranged from 1 to 5 and the total scores range from 9 to 45.

**Attitude Score: Score made up of the average answers for 21 attitude questions. The answers ranged from 1 to 5 and the total scores range from 21 to 105.

***Barriers Score: Score made up of the average answers for 15 barriers questions. The answers ranged from 1 to 5 and the total scores range from 15 to 75.

†Statistically significant between groups, P-value < .05.

66.8 ± 16.6 and 95% confidence interval for mean (65.0–68.7); that’s around 61.9% to 65.4% of a perfect score of 105.

There was no significant difference in the attitudes level between female and male students, 67.5 ± 16.5 and 66.1 ± 16.8, respectively (P = .457). However, there were statistical significance difference in attitude scores between students in different professional years (P = .001). The lowest attitude score was among P2 students and highest among P4 students, 61.2 ± 19.3 and 72.2 ± 11.2, respectively.

The association between the total scores of attitudes and years of program followed a similar trend to that of preparedness and was highly statistically significant with an F-value = 4.710 and P-value = .001 (< .05). The inter group mean of comparisons between P1 and P4 students showed highly statistically significant difference to P2 students in post hoc Bonferroni test, P-value = .005 and .008, respectively.

Barriers experienced by pharmacy students toward online learning

Barriers score was calculated from the sum of each question’s answer score (all 15 questions). Barriers experienced by pharmacy students during the online education process were evaluated and Average scores ± standard deviations are presented in Table 3. The barriers scores range from 15 to 75 with an average score of 43.6 ± 12.0 and 95% confidence interval for mean (40.0–48.7); that’s around 53.3% to 64.9% of a perfect score of 75.

Like the preparedness and attitude scores, there was no statistically significant difference in barriers score between male and female students (P-value = .287). But in contrast to preparedness and attitude scores, there was no statistically significant difference in the barriers score between students in different professional years (P-value = .339). The lowest barriers score was among P1 students (42.14 ± 12.1) and the highest was among P2 students (45.23 ± 13.6).

There was no association between total scores of barriers and years of program (P-value = .339). Additionally, intergroup mean comparisons between year of P1, P2, P3, and P4 students showed no statistically significant differences in the post hoc Bonferroni test.

Areas of development necessary for e-learning

Students identified certain areas of development as necessary for e-learning. About 30% of the students suggested a need for training on how to receive online courses. On the other hand, majority of the students (~66%) felt that there is no need for either basic computer literacy course or additional training in using computers or the internet. These results are shown in Table 4.

The association between total scores of preparedness as well as total score of barriers and the need for basic computer literacy course, the need for training in using computers and the internet and the need for training to help receive your online course showed statistically significant P-value < .05. However, such association was absent with the total scores of attitudes (P-value > .05). However, the association between total scores of attitudes and need for training on how to receive online courses was marginally statistically significant (P-value = .05). All these associations are summarized in Table 5.

Survey questions analysis

The number of students who answered each of the survey question were evaluated and the percentage of students who
answered questions by “agree or strongly agree” as well as “disagree or strongly disagree” in all 3 domains of preparedness, attitude, and barriers are shown.

The results indicated that about 61.4% of the students (range 11.9%-86.4%) agreed on that the College of Pharmacy was well-prepared and ready for the online learning during in face of the complete transition into online education as a result of the COVID-19 pandemic. However, only 19.9% disagreed with a perception of lack of preparedness (range 5.5%-66.7%).

The results also indicated that more than 49.2% of the students showed positive attitudes toward the provided online learning of the school instructors during the COVID-19 pandemic. However, only 26% showed negative attitude toward the online learning. Finally, the results indicated that about 34% of the students identify some barriers toward the provision of online learning by the College’s instructors during the COVID-19 pandemic. However, about 39% of the students did not identify any barrier.

**Discussion**

Distance online learning was adopted by almost all teaching institutions worldwide, including Saudi Arabia during the COVID-19 pandemic.\textsuperscript{16} The success of the distance online learning process depends on several factors including the internet quality and speed, ease of access to online resources, availability of suitable infrastructures of academic institutions as well as readiness of both instructors and students to adapt this technology.\textsuperscript{17-19}

The good preparedness scores were not surprising as students and faculty possess very good knowledge and practice of basic computer skills. They are also familiar with several aspects of the software utilized for online education, that is, Blackboard®, which has been used as the main learning management system (LMS) at the university. Nine Preparedness indicators were assessed among the participants in current study. In addition, the College has provided students and faculty with technical training and extensive technical support. These results are in line with previous studies conducted locally, regionally, and internationally. Two cohort studies from Saudi Arabia has shown that institutions are highly accessible for online learning technology and carry well-developed foundations for distant online learning.\textsuperscript{20,21}

The perceived lower preparedness of the second professional year might be due to the fact that students in this level are required to complete more courses and cases discussion than those in other years. In addition, this is the year were

**Table 4.** Descriptive analysis of student’s responses to areas of development necessary for the e-learning process.

| AREA OF DEVELOPMENT                        | NUMBER (%)                             |
|--------------------------------------------|----------------------------------------|
|                                            | YES (%)      | MAYBE (%) | NO NEED (%) |
| Need for basic computer literacy course    | 58 (18.8%)  | 46 (14.9%) | 205 (66.3%) |
| Need for training in using computers and the internet for the e-learning courses | 66 (21.4%)  | 34 (11.0%) | 209 (67.6%) |
| Need for training to help receive your online course | 93 (30.1%)  | 42 (13.6%) | 174 (56.3%) |

**Table 5.** Association between total scores of preparedness, barriers and attitude and perceived needs for improvement.

| DOMAIN                        | N   | SCORE ± SD | NEED | 
|-------------------------------|-----|------------|------|
|                               |     | COMPUTER LITERACY COURSE | TRAINING IN USING COMPUTERS AND THE INTERNET | TRAINING TO HELP RECEIVE ONLINE COURSE |
| Preparedness*                 | 58  | 31.43 ± 6.8 | Yes | Yes | Yes |
|                               | 46  | 30.78 ± 7.9 | Not sure | Not sure | Not sure |
|                               | 205 | 33.65 ± 7.1 | No | No | No |
| Barriers*                     | 58  | 47.38 ± 11.2 | Yes | Yes | Yes |
|                               | 46  | 44.07 ± 11.0 | Not sure | Not sure | Not sure |
|                               | 205 | 42.40 ± 12.3 | No | No | No |
| Attitude                      | 58  | 65.07 ± 16.7 | Yes | Yes | Yes |
|                               | 46  | 64.43 ± 16.2 | Not sure | Not sure | Not sure |
|                               | 205 | 67.82 ± 16.7 | No | No | No |

*Statistically significant association between the domain and all the perceived needs for improvement, \( P \)-value < .05.
students start taking and end up finishing the largest number of therapeutic courses which are heaviest on content than other courses in the Pharm.D. study plans. Students who are in the preparatory phase (pre-professional year) also perceived lower level of preparedness as they are still in the early phase of their education journey and they need more supervision and guidance throughout their courses, which, in general, is more feasible via the traditional learning and face-face interaction. It is interesting that although the first professional year contains the only practical course, that is, the Pharmacy Compounding laboratory, students at this level perceived higher level of preparedness. This indicated that the delivery method of the particle sessions which was effective. The lecturer used live demonstration sessions in addition to other pre-recorded demonstration videos and PowerPoint® presentations.

A similar trend in attitudes was observed in regard to gender and academic level. The lower attitude average score of second professional students can be attributed to the same reason of the perceived preparedness above.

The modesty of students’ belief that online learning allowed them to continue their education in the same way the traditional approach does, is triangulated by the fact they also favored face-to-face instruction over that online learning. This is supported by other studies that reported that attending classes in person, allows the academic and social interaction between the students and instructors and among students, the lack of such interaction undermines student learning and reduce their motivation levels. A study from Australia demonstrated that although there was no significant difference in the academic performance between the 2 learning methods, undergraduate students preferred traditional classrooms and face-to-face interactions to online learning for completion of their written competencies. In contrast, a study from Jordan found that mean achievement score for nursing laboratory students was higher among virtual class attendees compared to traditional class. While a third study from USA illustrated that the majority of medical students preferred the blinded learning methods consisting of both online and in-person laboratory practice for their microbiology laboratory course.

The current study revealed that most students reported that they do not need a computer skill literacy courses and they can use the online learning platforms for communicating effectively with instructors and other students without difficulties. Among the challenges that the participant of the current study students agreed on were lack of the motivation, feeling board during an online class, and that some of them took them long time to adapt to online learning tools. This in agreement with studies that have evaluated the challenges and barriers that could face student during their distance online learning process. These challenges included mainly the digital literacy among the students, technical problems, lack of motivation by some students toward virtual learning, information overload, “mind wondering” and maintaining long-term focus through the teaching session. According to recent commentary article, challenges and barriers during online learning in healthcare professions education can be overcome by following several effective measures such as implementing solid strategies to improve students engagement and reduce distraction and applying the cognitive theory principles that can help making the online learning experience more fruitful and meet the expected learning outcomes.

While many of the challenges encountered during the online learning could be overcome through adoption of several number of measurements. This is generally valid for theoretical courses where online learning can be of comparable quality to tradition learning. Depending fully on online methods for practical and experiential learning of health professions students is very challenging prospective as students are expected to experience and apply in real life patient-care situations.

The dissemination of the survey was also time sensitive due to the sudden nature of the pandemic. As a result, there is a possibility that relevant COVID-19 environmental factors might affect the quality of responses like fear, anxiety, or uncertainty. The instrument questions were adopted from different validated surveys that might need further validation. The questionnaire is adequately balanced and easy to answer, however more questions in each domain might be considered but rather need validation. The same idea could be implemented among other colleges of pharmacy in the area as sharing the experiences indeed will be a learning experience. Alternatively, online education was adopted by other colleges and in different settings and it will be valuable to learn and share with others their experiences. A further limitation of the present study is the possibility of students giving desirable responses based on what they perceive to be expected of them.

Conclusion
Up to our knowledge, this is the first study that evaluated the perception of pharmacy students toward the college’s and their own preparedness for distance learning, their attitudes toward the online learning experience during the quarantine period of COVID-19 outbreak and rapid adoption of fully online instruction in Saudi Arabia. Also, the study evaluated and identified the barriers perceived by the students toward distance online learning. Addressing these issues is expected to help in the continuous quality improvement of online learning as students’ progress into the next academic years. This is especially important as distance online learning platforms might be the only available mode of learning and teaching that can ensure learning continuity during unsurpassed events such as the COVID-19 outbreak.

This study revealed a positive attitude by pharmacy students at KSAU-HS toward online learning. Also, students have positively perceived the institutional, instructors and their own preparedness for the online learning. Majority of the students were satisfied with the online learning experience during the
university’s lockdown due to COVID-19. The path was not free of obstacles and extensive and continuous evaluation is required to identify best practices and pins areas for improvement in online learning process. This study evaluates a real-life experience for students new experience at a pandemic outbreak, and identified areas that might need improvement. Effective distance online learning in the health professions education has become a necessity that should take advantage of the rapid development of digital education platforms.

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Authors’ Contributions
MSS: Study conception and design, Acquisition of data: Analysis and interpretation of data, Drafting of manuscript: Critical revision, First and Corresponding Author. AMAB: Study conception and design, Acquisition of data: Analysis and interpretation of data, Critical revision. AA-A: Study conception, Analysis and interpretation of data, Drafting of manuscript: Critical revision. AAA: Study conception and design, Acquisition of data, Critical revision. AMQ: Study conception, Analysis and interpretation of data, Critical revision. AAO: Study conception and design, Acquisition of data: Critical revision. SAH: Study conception and design, Acquisition of data: Critical revision. SMM: Study conception and design, manuscript drafting, Critical revision.

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