

Impact of COVID-19 on student pharmacist academics, employment, and mental health

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ABSTRACT

Introduction: In March 2020, the coronavirus disease 2019 (COVID-19) pandemic required pharmacy schools in New York and New Jersey to make abrupt changes to course delivery. The aim of this study was to assess student pharmacist perception of the pandemic's impact on education, work, and mental health.

Methods: A 30-item survey was distributed to student pharmacists enrolled in three pharmacy schools located in New York and New Jersey. Survey questions evaluated the perceived impact of the COVID-19 pandemic on academics, mental health, and extracurricular employment.

Results: Nearly half of the participants (48.9%) admitted social distancing and the stay-at-home order negatively affected their mental health. Most (73%) reported getting along with those they live with. Many participants (61.1%) stated that the switch to remote learning caused anxiety over how well they would perform academically. Nearly two-thirds (65.1%) utilized coping strategies to optimize their mental health. Three-quarters of participants (75.6%) said that not being able to physically access the campus negatively impacted their motivation to study which was strongly associated with perceived negative impact on grades caused by the switch to remote learning (contingency coefficient = 0.870). Almost half of the participants (49.4%) believed their educational goals cannot be achieved to the same degree with remote online instruction. Many participants (61.1%) worked more shifts in their place of employment during the pandemic, and almost half (49.7%) revealed that this negative affected their studies. There was a strong association between fear of contracting SARS-CoV-2 and working in a pharmacy setting (contingency coefficient = 0.866).

Conclusion: Changes that came about due to the COVID-19 pandemic affected student pharmacists' education, work, and mental health. The long-term impact of these changes is unknown.

Introduction

The SARS-CoV-2 coronavirus disease 2019 (COVID-19) pandemic has had a dramatic and unprecedented impact on pharmacy education in the United States (US). In the beginning of this public health crisis, New York City and surrounding areas, such as northern New Jersey, were affected the most, compared to the rest of the country.¹ In mid-March 2020, pharmacy schools in this area made swift transitions to remote, online learning as the Governors of New York and New Jersey signed stay-at-home orders. As a result, all non-essential businesses were ordered to close indefinitely. Many school administrators were forced to make difficult decisions quickly to ensure the safety and wellbeing of their students, faculty, and staff. Beginning in mid-May and extending into June, these orders were gradually lifted.^{2,3} Student pharmacists were expected to rapidly adapt to these changes while continuing their studies during the Spring 2020 semester.

There are numerous commentaries published about how pharmacy schools adjusted to the COVID-19 pandemic and how to tackle impending challenges moving forward.⁴⁻¹³ However, to date, there are not many publications about the perceived impact of quarantine on US student pharmacists' educational experiences, work obligations, and mental health during the COVID-19 pandemic. This study aims to investigate student pharmacists' perceptions of the COVID-19 pandemic's impact on their education, work, and mental health.

Methods

Student pharmacists from three northeast schools of pharmacy (Fairleigh Dickinson University in New Jersey, Rutgers – The State University of New Jersey, and Long Island University in New York) were invited to complete an electronic, 30-item survey (29 multiple choice, 1 open ended) evaluating students' perceptions of the COVID-19 pandemic's effect on pharmacy education and work-related experiences. Students received an email containing a Qualtrics® (Provo, UT) survey link and consent information on day 0 with scheduled reminders at days 4 and 6. Participation was voluntary, responses were anonymous, and subjects were able to skip questions, if desired. Research activities were deemed exempt by each university's Institutional Review Board.

Survey questions evaluated demographic information and students' perceptions regarding work experience, personal protective equipment (PPE), mental health, anxiety, motivation, coping strategies, online teaching/learning environments, academic integrity, and as applicable, the impact of COVID-related changes to

each area. Nineteen questions, including one open-ended question, were asked of all study subjects. The remaining 11 questions were response dependent and only displayed when applicable.

Descriptive statistics (Frequency Count, %) were used to summarize the demographic and psychological characteristics. Cross tabulation and Chi-square test of significance were performed to study the association between attributes. Contingency Coefficient was studied to measure the strength of association between variables.

Results

The 30-item survey was distributed to 1,217 student pharmacists attending one of the three pharmacy schools. The time to complete the survey questionnaire was 7-10 minutes. A total of 353 students completed the survey (response rate=29%). The majority of the survey respondents were female [254/353 (72.8%)] and 20-24 years of age [264/353 (74.8%)]. Most students reported spending 0-30 minutes [163/353 (46.3%)] or 31-60 minutes [127/353 (36.1%)] commuting to school daily before the stay-at-home orders were implemented. Respondents' years in pharmacy school (P1-P4) were evenly distributed. Table 1 describes study participants' baseline characteristics.

At the time of the survey, 97.4% of participants lived with others. Most participants (80%) reported that working in a pharmacy had increased their fears of contracting SARS-CoV-2 virus. Almost all participants (96.8%) used PPE at work. Most participants were provided with necessary PPE needed to safely perform their duties at work by March 2020 (53.2%) or April 2020 (33.2%). A small number (7.2%) never received PPE from their employers. Only 21.2% of participants created their own masks at home due to lack of PPE at work. Most participants (64.2%) did not believe a home-made mask was enough to protect from COVID-19. Nearly half of participants (48.9%) responded that social distancing and the stay-at-home order negatively affected their mental health. Most participants (73%) reported "getting along" with those they live with. Nearly two-thirds of participants (65.1%) utilized coping strategies to optimize their mental health during the COVID-19 pandemic. Participants used various coping strategies including staying connected with friends and family via phone calls, texting, and video chatting (26.5%); exercising (24.8%); baking or cooking (19.4%); leisurely reading (11.1%); meditation (10.2%); and gardening (3.88%). Twenty-nine participants provided free text responses for other coping strategies utilized which included playing video games, listening to music, working, producing arts and

crafts, watching movies, receiving therapy, dancing, shopping, fasting, and participating in religious activities. Many participants (79.1%) felt these coping strategies helped optimize their mental health during the COVID-19 pandemic. Many participants (61.1%) felt the switch from in-person to online teaching and learning created anxiety regarding how well they would perform academically. When questioned about anxiety over resuming in-person classes in the Fall 2020 semester, most participants (69.7%) indicated either very anxious or somewhat anxious.

Many participants worked more shifts due to the COVID-19 pandemic (61.1%). Of those who worked more shifts, approximately half (49.7%) reported that the increased workload had a negative impact on their studies. When asked if they like the online teaching and learning environment that commenced after the COVID-19 stay-at-home order, 42.7% stated they did not like it. Participant response about the perceived impact the remote online teaching and learning environment will have on their grades was evenly distributed, with 35.9% feeling it will have a positive impact on their grades, 37% feeling it will have a negative impact, and 27.1% believing it will not influence their grades. Half of the participants (50.9%) felt the integrity of assessments were compromised after switching to virtual delivery. Most participants (75.6%) felt not being able to physically access campus has negatively affected their motivation and ability to study. Almost half of the participants (49.4%) believed their educational goals cannot be achieved to the same degree with remote online instruction. Most participants (57.7%) would take advantage of online course offerings in lieu of live in-person classes should they become available in the program. Fifty-six percent of participants thought the fall semester should be offered online. When questioned which remote online teaching format best meets their learning needs, 61.3% responded pre-recorded lectures, 29.94% preferred live lectures, and 8.7% responded with other formats. Other formats described by free text responses included a combination of live and recorded lectures. When questioned about how to improve remote online learning in the future, trends from 197 free text responses included making lectures interactive, live lecture with recordings, consistency amongst courses and faculty, timely upload of pre-recorded lectures, office hours with faculty, proctoring services, smaller group virtual sessions, increased video and visual content, pass/fail option, more quizzes, compassion from faculty, more resources to support self-learning, question and answer sessions with faculty, in-person exams, use of questions during lecture, use of polling

technology, standard exam format, required attendance, homework assignments, extended exam duration, and use of breakout room feature on Zoom Video Communications. Refer to Table 2 for result details.

In an analysis of whether the motivation to study had impacted grades, 46% of participants who had reported negative impact on motivation also reported a perceived negative effect on the course grades. The Chi-square test (Pearson's significance level of 0.000), with a contingency coefficient of 0.870 revealed a strong association between participants who reported negative impact on motivation to study on account of not being able to physically access the campus and perceived negative impact on grades due to online teaching and learning. The Chi-square test with a Pearson's significance level of 0.000 and a contingency coefficient of 0.848 revealed a significant association between participants in different years of pharmacy school and negative mental health. Participants in their P2 year were more affected followed by participants in P4, P1, and P3 years, respectively. There was also a significant association between participants working in different types of pharmacy settings and increased fear of contracting SARS-CoV-2 virus, due to the Chi-square significance of 0.000 and contingency coefficient of 0.866. Participants working in the community setting expressed fear more frequently than those working in other settings. Refer to Table 3 for a detailed description of this analysis.

Discussion

The disruptive nature of the COVID-19 pandemic has impacted higher education, including pharmacy education. In the Spring 2020 semester, faculty and staff transitioned from in-person instruction to remote teaching and learning with little time to prepare for this unprecedented shift in instructional delivery. Student pharmacists were expected to continue learning difficult course material more independently in a remote setting with less support from their peers, faculty, and staff. This study evaluated student pharmacists' perception of the COVID-19 pandemic's impact on their education, work, and mental health.

Participants' demographic characteristics are mostly female, aged 20-24 years which is similar to the demographics of student pharmacists in the United States.¹⁴ There was an even distribution of participants in P1, P2, P3, and P4 year of study who represented three pharmacy programs in the Northeast region: Rutgers University, Fairleigh Dickinson University, and Long Island University.

A majority (61%) of participants reported experiencing anxiety over their academic performance due to the transition to virtual learning. This finding raises an interesting question on how prepared pharmacy programs were for such a transition, given the significant increase in digital and virtual technology utilized in pharmacy education.¹⁵ The benefit of these tools as aids in curricular delivery has been described in pharmacy literature.¹⁶ Resource-savings and improvements in learning have also been illustrated.¹⁷ Incorporation of educational technology appears to align with today's independent, task-oriented generation of student learners and the need for a more modern approach of instructional technology in pharmacy education is apparent.¹⁸⁻²⁰

There was a strong association between participants' pharmacy school year and negative impact on mental health as a result of the stay-at-home order. Participants in their P2 year were most affected compared to other classes, which is an unexpected finding. Given the uncertainty of their impending graduation and licensure, it would be presumed that participants in their P4 year would have the strongest association to negative mental health. These findings may be due to the timing of survey administration which was after the Spring 2020 semester. Results from this study underscore the importance of providing mental health support to all student pharmacists beyond the care available in student counseling services. Currently, most mental health services are offered in a reactive manner, meaning that the burden is on the student to recognize their symptoms and ask for help. This pandemic has reminded educators that this method is insufficient to address mental health needs and a more proactive approach should be developed. Mental hygiene and wellness topics can be incorporated into co-curricular programming which will increase awareness and access for students. Co-curricular experiences are mentioned in a number of Accreditation Council for Pharmacy Education (ACPE) standards and therefore widely adopted by pharmacy schools across the nation.²¹ For this reason, it is a strategic place in pharmacy education to enhance emphasis on mental health activities allowing educators to take a more proactive approach to this problem.

Most participants working in a pharmacy setting also indicated a fear of contracting SARS-CoV-2 virus. A strong association existed between participants working in the community setting and a fear of contracting SARS-CoV-2 virus. This potentially added another layer of stress to the anxiety caused by virtual learning. The finding of increased anxiety associated with the transition to virtual learning may point to a need for additional resources to assist students and faculty during such changes. A reassuring result is that the majority (65.1%) of

participants used coping strategies to manage mental health concerns. Coping strategies should be emphasized and encouraged when preparing students for and transitioning them to virtual learning. Interestingly, although the majority of the participants experienced anxiety when transitioning to online instruction, 61% indicated that they preferred pre-recorded lectures, which do not offer the interactive nature of live lectures. This preference may point to a need for pharmacy programs to consider a hybrid option for teaching, especially in programs with a higher population of commuter students.

Approximately three-quarters of the participants (75.6%) stated that not being able to physically access the campus negatively affected their motivation to study, which strongly associated with perceived negative impact on grades. More than half the participants (61.1%) also expressed that the switch from in-person to online teaching created anxiety over their academic performance. Interestingly, despite the negative impact on motivation, perceived negative impact on grades, and increased anxiety over online course offerings during the Spring 2020 semester, most participants expressed a certain level of anxiety over resuming classes in-person for the Fall 2020 semester and thought that they should also be offered online. This could be due to the fear of physically being on campus and in close proximity to other students, potentially increasing the risk for SARS-CoV-2 transmission. Issues with social distancing and proper mask wearing may also be associated with such fears.

Over half the participants (61.1%) who work in a pharmacy setting also reported working more shifts during the pandemic. Within this group, almost half reported a perceived negative impact on their studies while approximately 42% stated it had no impact. It is unknown whether participants volunteered to work more due to an increase in free time or were required to work more by their employers based on an increased demand during the pandemic. Therefore, it cannot be stated with certainty that the perceived negative effect on studies was due to the pandemic. While virtual instruction is not novel in pharmacy education, it is new to the participants of this study. Survey results indicate that a large portion of participants (42.7%) did not like online teaching and learning, while almost a quarter (23.6%) were undecided. Almost half the participants felt that the integrity of assessments were compromised, while more than half were either unsure or believed their academic goals were jeopardized due to the shift to remote learning. These results demonstrate an overall dissatisfaction by study participants with the changes that occurred due to the pandemic. Faculty may consider offering additional tools to better support

students while online instruction continues. Tools may include formation of virtual study groups, additional instructional time, and extended office hours to accommodate students who work. Some programs have created socialization opportunities in the forms of virtual coffee chats and co-curricular events. Others have implemented weekly Zoom check-in sessions with students, hosted training for transitioning to virtual platforms, and utilized social media to share new teaching delivery methods and to celebrate student and faculty accomplishments.⁷ School administrators may pursue alternative proctoring methods to preserve exam integrity and minimize academic dishonesty. Administrators may utilize faculty and staff to proctor students virtually in real-time or purchase third-party proctoring technology. There is concern of privacy violations with third-party proctoring services which might cause additional anxiety for students.²² This should be considered when searching for solutions to exam administration problems in the virtual setting.

A study by Aucejo et al found that the COVID-19 pandemic caused students to delay graduation, change majors, and discontinue classes. A decrease in academic performance and a negative effect on students' job prospects post-graduation are also notable concerns.²³ Perceived negative impact on academic performance was duplicated in this study. Perhaps, these uncertain times may facilitate the development of other Center for the Advancement of Pharmacy Education (CAPE) outcomes such as leadership, problem solving skills, spirit of entrepreneurship, innovation, and resilience within student pharmacists.^{4,24} These are skills that they may not have otherwise learned or have exposure to in a normal educational environment. This is a period of time where student pharmacists and educators can learn from each other alike and witness pharmacy practice in motion during COVID-19 pandemic.

Limitations of the study include variation in results among students with different learning styles and socioeconomic backgrounds which was not considered in this study. Survey questions were not validated which is also a limitation of this study. A little over half of the participants were not sure or felt unaffected by the psychological impact of COVID-19. This finding may have changed over the course of the pandemic and since the survey was administered. Factors such as family affected by the disease, loss of employment, and working in the pharmacy may have impacted respondents, psychologically. Evaluating the impact of these additional factors would be an interesting and warranted development for a future study. Findings may shed some light on students'

attitudes towards remote learning and provide direction to pharmacy institutions who are considering incorporating virtual instruction in post-pandemic curriculum.

Conclusion

The COVID-19 pandemic forced schools of pharmacy in New Jersey and New York to make abrupt changes to course delivery. As a result, these changes impacted student pharmacists' academics, work, and mental health. Long-term impact of the COVID-19 pandemic on student pharmacists' learning is difficult to predict and requires further investigation.

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