Impact of Virtual Learning in a Pharmacy Program

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ABSTRACT

Aim: The COVID 19 pandemic has caused many schools to switch to a completely online platform. The focus of this study was to get the opinion of students on the effect of virtual learning on pharmacy students and learning and how it has impacted their education experience thus far.

Methods: An online study questionnaire was administered to 44 student pharmacists with a one hundred response rate. All study participants were enrolled to take a Drug Informatics class, which is a two- credit mandatory course at our university. The data was then evaluated and analyzed with the use of SPSS statistical software.

Results: The results of this study show that virtual learning is rated as favorable by the participants and they feel confident in the knowledge they are gaining. There were more females (n=34; 77.3%), in age range between 18 to 24 years of age (n=25; 58.1%) with a residence outside the DMV metropolitan area (n=19; 43.2%) and have at least a bachelor's degree (n=30;68.3%). Most of them had pharmacy or health-related jobs before joining the pharmacy program (n=36; 83.7%). Most study participants enjoy virtual pharmacy school (n=27; 61.4%) and most participants feel they are still being adequately prepared for their assessments (n=28; 63.7%). The finding of students feeling prepared is very strong. Over sixty percent (n=27; 62.8%) have no issues establishing relationship with their colleagues or their professors and over seventy percent (n=31; 70.5%) always attend virtual classes.

Conclusion: Virtual learning can be viewed as a beneficial and a positive alternative to in person learning in situations, like during the COVID 19 pandemic. Students were in favor of virtual learning even though they are in a virtual setting. Those who worked longer years and with a higher degree before joining the pharmacy program had rated highly of their satisfaction with a virtual class. Close to three-quarter of the participants attend virtual classroom fully even if attendance is not a requirement in the school. However, being a female, younger age, and living outside the DMV area are considered as predictors for a higher attendance rate. These results are important because it gives an insight on how pharmacy students feel about virtual learning. Study results can perhaps be utilized to help see the impact of current online learning and implement new virtual learning techniques in the future.

Introduction

It has been over a year since COVID 19 appeared and almost a year since schools and institutions switched from face-to-face learning to fully online courses and activities. Though many schools have tried to accommodate and help reduce the burden of online learning with things such as pass/fail grades, many disadvantages are still present. Many studies list the faults to online learning. They talk of increased distractions, reduced resources, training, and support needed for teachers, and decreased performance

in students. About 1/3 of the country has reported that they do not have access to fast or proper internet connection in their households [1]. This can be a huge issue for students trying to connect to lectures and complete work on the various platforms. With professional school, especially those in the health -related fields, hands on learning is an important aspect. There are various labs in which students need to complete and experiential courses they must experience. Effectively putting on lab courses was one of the main obstacles that some schools faced [2]. Student rotation, introductory pharmacy practice experiences (IPPE) and advanced pharmacy practice experiences (APPE), site assignments also became a challenge. Many sites that students had been placed got cancelled or had to switch to an online platform.

This due to the fact that many health systems shut their doors to students to reduce the risks of COVID transmission [3]. Faculty at institutions had to work hard to create new sites for students or help them with the switch to virtual experiential opportunities [3]. While many studies talked about the downsides, some studies produced results that showed face -to-face learning and virtual learning as being equally effective in teaching pharmacy students [4]. Some studies refer to the benefits that have come out of having to switch to using an online platform. The switch to Zoom being the new norm, has allowed individuals who may never have met or interacted, to be able to meet and collaborate on many things together [3]. This is a positive outcome to something at first considered an obstacle for students. A few studies talked about the effect on student's social interactions and their relationships with peers and faculty. The goal of this study is to get a better view of a student's point of view and to see if virtual learning effects students for better or worse, and to what extent. Many of the studies that have been conducted focus mainly on the academic side of things and how the shift to virtual learning has affected student pharmacist's studies/grades. Few studies touch on the social and mental effects of virtual learning. With this study the hope is to get a more cohesive/all around look at how COVID and virtual learning has affected pharmacy students.

Methods Section

A questionnaire with the study survey was administered to 44 first professional year pharmacy school students with 100 percent response rate. There were 14 questions in the survey. The first 9 questions consisted of demographic related questions, while the last 5 questions related to the student's opinion on virtual learning in pharmacy school. The survey was distributed to students in the Drug Informatics Course, a mandatory course for first year pharmacy students that teaches pharmacy students how to use drug information technology and the benefits of having this knowledge as a pharmacist. The questions included in the survey were also created by students in the Drug Informatics Course as an

assignment. All data collected was with the use of an online survey instrument and was analyzed with the use of the SPSS statistical software. A Chi Square regression analysis was conducted to analyze the impact of the demographics on the survey questions.

Study Results

The study population consisted of first professional year pharmacy students at the Howard University College of Pharmacy. There was a total of 44 student survey responses that were submitted. Some of the demographic questions data (gender, age, residence before Howard) are summarized in both Tables 1 & 2. The study population used was mainly female compared to male. There were 34 females (n=34;77.3%) in the population and only 10 males (n=10;22.7%). The majority of students' ages ranged from 18-24 years old (n=25; 58.1%). Student age range of 25-34 years old consisted of the next largest group (n=18; 41.9%) and there were no students above the age of 34 years old. Participants were asked where they resided before coming to Howard: District of Colombia, Maryland, Virginia, or other. Majority of study participants came from other states with a count of 19 (43.2%), although the university is located in DC. The students that came from MD consisted of the next highest number of students 12 (27.3%), followed by VA with a count of 9 (20.5%), and finally DC with a count of 4 (9.1%). This data is shown in Table 2 above.

Table 1: Student Demographics.

Demographic Characteristics			
• Gender	Male 10 (22.7%)	Female 34 (77.3%)	Other -
• Age (Years)	18-24 years 25 (58.1)	25-34 years 18 (41.9%)	> 34 years -

Table 2: Where Did Student's Live Before Joining the Howard Pharmacy Program.

DC:	MD:	VA:	Other:
4 (9.1%)	12 (27.3%)	9 (20.5%)	19 (43.2%)

In Table 3 the data depicted consists of demographic information pertaining to the students' job experience. The questions asked students about working, the income they received, how long they worked, and the type of field they worked. Most individuals (n=42; 95.5%) had a job before starting pharmacy school. Of those who worked before coming to pharmacy school 27 (62.8%) worked in a pharmacy related field, 9 (20.9%) work in a non-pharmacy related field, and 7 (16.3%) worked in a non-pharmacy/non-health related field. The majority of students who worked had an annual salary of less than $10K (n=17; 39.5%). Most students worked 1 to 3 years before coming to Howard (n=14; 31.8%). The majority of participants (n=30; 59.1%) had an education level of at least 4 years of college or higher.

Table 3: Student's Life Before Starting Pharmacy Program.

Have you worked before coming to HU?	Response Rate (%)	Number of Responses
· Yes	95.50%	42
· No	4.50%	2
Annual Income if you have Worked		
· <10K	39.50%	17
· $10K- $19K	16.30%	7
· $20K- $29K	7%	3
· $30K- $39K	18.60%	8
· $40K- $49K	7%	3
· > $49K	11.60%	5
Type of Job Held		
· Pharmacy Related	62.80%	27
· Non-Pharmacy Related	20.90%	9
· Non-Rx or Health Related	16.30%	7
Number of Years Worked before Coming to HU		
· < 1year	15.90%	7
· 1-3 years	31.80%	14
· 4-5 years	25%	11
· > 5 years	25%	11
Education Level		
Pre-request	27.30%	12
· Associate	4.50%	2
· BA/BSc	59.10%	26
· MSc/Professional	9.10%	4

It can be seen in Table 4 that most students (n=13; 70.5%) say they attend their classes even though they are in a virtual setting. It seems that despite being in a completely virtual setting most students (n=27; 62.8%) still are able to establish connections with their peers and build relationships with their professors. The majority (n=26; 59.1%) of study participants felt that they are comfortable and able to address questions or concerns they experience during a virtual environment. For the question, "I enjoy virtual learning as a first-year pharmacy student", 27 students (61.4%) of participants agreed. Virtual learning has still allowed students to feel confident in their classwork and their knowledge for tests, as agreed by over half of the participants (n=28; 63.8%).

Table 4: Survey Question Answers.

	Since most lectures are available on recordings, I may not always attend virtual classes	I am still for me to establish relationships with my colleagues and professors during the virtual environment.	I'm also comfortable addressing my concerns in a virtual environment.	I enjoy virtual learning as a first-year pharmacy student.	I feel adequately prepared for virtual administered exams and quizzes.
Strongly Agree:	4 (9.1%)	8 (18.6%)	9 (20.5%)	11 (25%)	8 (18.2%)
Somewhat Agree:	9 (20.5%)	19 (44.2%)	17 (38.6%)	16 (36.4%)	20 (45.5%)
Somewhat Disagree:	9 (20.5%)	11 (25.6%)	14 (31.8%)	7 (15.9%)	13 (29.5%)
Strongly Disagree:	22 (50%)	5 (11.6%)	4 (9.1%)	10 (22.7%)	3 (6.8%)

A Chi- square regression analysis was done to see the effect of demographics on the outcome using SPSS statistical software. Accordingly, the age of the subjects was a factor that influenced whether students would still attend virtual class or not (p-value= 0.041). Those in the age range 25-34 years old were more likely to not attend class (38.9%), compared to those in the age range 18-24years old (24%). The state in which participants previously lived in was also a factor that had influence on how often students go to online classes (p-value =0.029). Study participants who previously resided in MD seemed like they were more likely to not always attend class (58.3%) comparing to those from DC, VA, or other States. For the question of whether students enjoyed

virtual learning, working prior to attending pharmacy school was a factor (p-value= 0.019). Those who had not previously worked before attending Howard and those who worked 1-3 years did not either (71.4%) did not seem to enjoy virtual pharmacy school as much, whereas the majority of those who worked less than 1 year (71.4%) or worked 4-5 years (81.8%) before Howard enjoy virtual pharmacy school say the opposite. Education level completed before joining the pharmacy program was also something that had an impact on whether students were comfortable addressing their concerns in a virtual environment (p-value =0.057). Those who had two or more years of college felt more comfortable addressing their concerns (2 years (100%), vs. those with more years of training (4 years; 65.3% and Professional; 75%).

Gender somewhat played a role when it came to commonly missing virtual classes. There is a tendency that females were more likely to attend all virtual sessions compared to the males, however, it has not reached statistical significance (p-value = 0.067). Half of the study male participants agreed that since lectures are virtual/recorded, they may not always attend, while only 23.5% of female participants agreed with this statement. There is also a tendency that having a higher education played a role in whether or not individuals enjoyed virtual learning. Those with more years of education seemed to enjoy virtual learning (4 years of college 69.2% and professional education 100%), compared to participants with only some college in which the majority disagreed (66.6%). However, it has not reached statistical significance. Those with 2 years of college were neutral 50/50 split.

Discussion

The goal of this study was to get students' opinion on how virtual learning due to the COVID 19 pandemic has affected the learning environment of those pursing a doctorate degree in pharmacy. Our focus was not the effect of virtual learning on grades and GPA averages, but about how comfortable these students felt about virtual learning and the challenges they may experience. The results from the study, showed virtual learning in a positive light. Majority of participants viewed online classes as beneficial. Based on the results the majority of participants stated that they enjoyed virtual pharmacy school (61.4%). Virtual learning does not seem to have affected students' confidence in knowledge for tests/examinations or their ability to communicate with university faculty. In the study results, most students (63.7%) answered that they felt they were adequately prepared to take their tests and quizzes. Majority of pharmacy students (62.8%) also felt that despite being in a fully virtual setting, they are able to still form bonds/connections with their peers and university faculty. The results of this study are significant because it shows that virtual learning can be effective for pharmacy students and they can

continue to grow as professionals. This is so important because pharmacists are essential healthcare workers, and their education quality needs to be maintained. This study shows that even though the world is in a pandemic and everything is virtual, the future pharmacists that come out will be confident that they are prepared educationally and fully equipped.

Some studies discuss the many distractions that come with virtual learning and how that can negatively impact students' learning. The results from our study differ from this, as most study participants stated that they felt adequately prepared for their tests/assessments. A few studies believe in the potential benefit to using an online platform for learning. This correlates with our study findings, as study results show online learning in a positive light. Another study showed that online learning is just as effective as face-to-face learning for students. This is similar to the results from our study. Our study results correlate with students still being prepared and enjoying learning in an online environment. There were limitations to this study. First, this pool of participants was somewhat limited, due to the fact that the participants all were first year pharmacy students. Second, the viewpoint of first year students may differ from the view-point of higher -level students. Third, these students also have never experienced pharmacy school in person, so they have nothing to compare their online experience to. This study is a snapshot of how virtual learning has affected students. Broadening the participant pool in the future to get a more complete look at how virtual learning has affected all levels of pharmacy school is recommended.

Conclusion

How has the COVID 19 pandemic impacted pharmacy students? This is the question that this study is focused on and set out to discover, using a survey tool among pharmacy students. The results of this study sheds light on how pharmacy students feel about virtual learning and their opinion. In this study it was found that virtual learning is something pharmacy students are comfortable with. It was also discovered that students still feel prepared, and they feel comfortable with online interaction with faculty. The results of this study are beneficial because it shows that virtual learning can have positive outcomes. Perhaps pharmacy schools can even continue some of the virtual aspects after the pandemic is over. Although this study and its findings were beneficial, further investigation should be done to solidify results.

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