

# Student Perspective on Distance Online Learning Experience During the COVID-19 Pandemic in Undergraduate Pharmacy Program in UiTM: Pharmacology of CNS Drugs

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*Abstract: The method of teaching and learning (T&L) has changed radically due to the COVID-19 pandemic, globally. Schools and universities had to adapt to a new T&L experience by moving into hybrid learning or fully electronic online mode. As for the third-year pharmacy students in UiTM, the Faculty of Pharmacy employed 100% online distance learning (ODL). Hence, this study aims to evaluate the third-year pharmacy student ODL experience during the COVID-19 pandemic on one of the core subjects, Pharmacology of Central Nervous System (CNS) Drugs. The online survey was distributed to students at the end of the semester. Multiple questions made up a score that reflects their perspective on the subject relevant to the ODL experience. The survey was voluntary, and all data were collected and recorded via google forms. The response rate was about 74% (n=186). The results' analysis revealed some variable responses. The ODL experience poses many challenges not only to the students but lecturers alike. The burden of completing assignments and at the same time coping with the current situation of an uncondusive environment at home with internet instability has pushed the students to almost a breaking point. Hence, a more structured plan needs to be implemented to ensure the students have the best for their academic development to pursue their professional careers without compromising their soft skills.*

*Keywords: COVID-19, pharmacy, pharmacology, online distance learning, online platforms*

## **INTRODUCTION**

Most of the academic institutions around the world have adopted some forms of electronic learning many years ago as a supportive and efficient tool to their face-to-face classes and as a blended-learning method to student assignment submission and the conducting of exams, with comparable quality to traditional learning but at lower costs and higher convenience for students and instructors (Gherhes et al., 2021). The current Coronavirus disease for 2019 (COVID-19) pandemic situation caused massive chaos, and the rapid spread of the novel Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-COV-2) virus worldwide has disrupted many areas including education (García-Morales et al., 2021; Marinoni et al., 2020). According to the United Nations Educational, Scientific and Cultural Organization (UNESCO) most recent reports, more than 180 countries have closed their educational institutions and suspended physical classes on campus in response to health authorities' advice 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 (UNESCO, 2021). This pandemic may influence negatively both cognitive and non-cognitive skills acquisition and may have significant long-term consequences in addition to the short-term ones (Di Pietro et al., 2020). Almost all countries have moved their courses and teaching programs delivery to a fully ODL mode. Pharmacy and other health professions educations rely on different traditional and student-centred teaching methodologies involving didactic lectures and seminars, industrial and practical training, and laboratory sessions, as well as problem-based or case-based techniques such as small group discussions and hospital attachments (Galvao et al., 2014; Imanieh et al., 2014; Meng et al., 2019; Nouri AI et al., 2020; Mohamed Ibrahim, 2018). Didactic lectures can be conducted in either a traditional classroom (face-to face-learning) or through virtual online learning if it is the only available method of teaching, that is when academic institutions shift to virtual platforms exclusively (Leiber, 2019). However, the quality of these methodologies of teaching is expected to be comparable and the achievement of learning outcomes is not to be compromised, whatsoever in any situation. Unfortunately, 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 (Mohamed Ibrahim, 2018; Singh, 2018). During the pandemic, lecturers were required to adapt quickly to the rapid transition in the education process and depend completely on the online platforms available to deliver their courses, exams, and other required teaching and learning activities. While the rapid transition to ODL was a mandatory and necessary action to ensure learning continuity during the COVID-19 pandemic, it was not always a smooth process, and posed many challenges for lecturers, learners, and their families (Almetwazi et al., 2020; Ashiq, Bajwa and Ashiq, 2020; Efendie, Abdullah and Yusuf, 2020). The impact on student's mental health, lack of motivation by learners, difficulty in adapting to ODL methods, technical and bandwidth problems, and content creation of ODL materials for didactic and, especially, practical and laboratory-based courses, were among the main challenges encountered (Al-Kumaim et al., 2021; Ferri et al., 2020; Shawaqfeh et al., 2020). The inability to conduct face-to-face practicals require a creative approach to change from physical interaction to virtual communication. Even industrial attachment requirement was conducted virtually. Other challenges include the economic impact on families and the immediate and high demand for training and IT support that included the aspect of speed and quality of internet connection (Browning et al., 2021; Cullinan et al., 2021; Qandil and Abdel-Halim, 2020). The Bachelor of Pharmacy (Hons) (BPharm) program at the Faculty of Pharmacy, Universiti Teknologi MARA, Malaysia is a nationally accredited pharmacy program. The program is steadily evolving to accommodate the demand of local needs and new national and international professional trends. In addition, the program thrives to improve its pedagogical approaches to maintain the quality of the learning process. It is crucial to get feedback from the stakeholders, especially the students, as evaluation of their courses and the teaching process can provide direct and indirect quality indicators and is a channel for constructive feedback for program administrators and the faculty. Analysis of evaluation results is used in the continuous quality improvement (CQI) of the program. Hence, this study aims to obtain the third-year pharmacy students' feedback at the end of a course; Pharmacology of CNS Drugs; to assess their perception of the transition to ODL imposed by the COVID-19 pandemic.

## **METHODOLOGY**

### **2.1 Rationale**

This study emphasizes the investigation of an ODL experience in which course design and delivery that was initially designed for blended learning had to be drastically transformed to an online instructional design strategy. This was planned and implemented to alleviate the negative effects of the COVID-19 pandemic, a big step taken by the management of UiTM. Consequently, the choice to investigate student attitudes and perceptions, although seeming subjective, is key to evaluate the experience under these circumstances, which are shared by many institutions and programs around the world. This study will look at the ODL experience of students and faculty as this mode of delivery is going to become the new norm, at least partially. Google Classroom is used for all teaching sessions where all the instructions and assignments are given including links to the recorded lectures or live lectures. Live lectures are conducted via Webex or Microsoft Team while Padlet and Google Meet were used for interactive and discussion sessions. Other online interactive games and quizzes were also employed to engage the students' understanding of the topics being taught. Instructional materials were delivered, both synchronously and asynchronously.

### **2.2 Study design**

The data for this study were based on students' experiences during the period they were involved in ODL offered by the Faculty of Pharmacy at UiTM. The transition to ODL was in response to a whole country lockdown similar to all countries in the world. During that time, lectures, seminars, and examinations were conducted from distance by online methods and virtual platforms. These educational activities were planned to be carried out similar to the regular semester of 14 weeks with modifications to suit the ODL approach. Any changes were communicated to all students ahead of time, that included but were not limited to scheduling, assessment, grade distribution, as

well as addition or deletion of educational activities. A guideline was given to both parties i.e. lecturers and students. All activities that need physical presence were suspended and each course had an action plan with significant details for all further requirements. Online learning was a mixture of live online sessions, recorded lectures, online live discussions, and presentations. There was one online midterm exam at week 8 using a web-based learning management system (LMS), Canvas, for each course as well as pre-announced course-related assignments, which was documented in the course plan of each course. There was full technical support available for faculty and students throughout the pandemic lockdown period.

The faculty's academic administration closely monitored all educational activities between faculty, students, and resource person i.e. lecturer-in-charge. All changes in each course were documented in compliance with quality assurance standards aligned with the program learning outcomes and course learning outcomes. Students were asked to complete an online questionnaire as an exit survey, in addition to what was required by the UiTM's Academic Affairs Unit under UFUTUTRE (an internal platform for delivering learning content online). Participants were given a link to the questionnaire and a statement informing them that participation is important for the improvement of their ODL experience, but at the same time their identities will stay anonymous to maintain privacy and that their responses will be strictly confidential.

### **2.3 Sample and setting**

The study sample included all third-year pharmacy students from both genders who are currently enrolled in the BPharm program, as of the academic year 2020-2021, at the Faculty of Pharmacy, UiTM, Malaysia. The survey questionnaire was sent to students via a link in the Google Classroom after the conclusion of the semester and given adequate time to respond. A reminder was given a few days before the deadline.

## **2.4 Questionnaire design**

The survey contained simple questions on the preparedness of the course, attitudes towards the course, the online education tools used and barriers to the online learning domain. The survey was designed based on previously validated scales and qualitative information collected at the beginning of the pandemic lockdown (unpublished). The validation and reliability of the final survey were not performed. The final questionnaire consisted of 3 major domains; the students' preparedness domain, attitudes domain to online learning and barriers domain. Likert scale-based questions were used to assess the 2 major domains with a total number of 3 questions to assess the preparedness domain and 2 questions to assess the attitudes domain. Each answer was given a point-based score (strongly disagree=1 point, disagree=2, neutral=3, agree=4, strongly agree=5 points). This leads to perfect scores of 15 for the preparedness, and attitude domains. To assess the barriers domain, 2 open-ended questions were asked so that they can answer based on their complete knowledge, feeling, and understanding. It means that the response to this question is not limited to a set of options. Keywords were identified and grouped by theme to form five categories: interaction (including communication with instructors and other students), convenience (including the suitability of the approaches used), structure (including clarity, instructor's facility with online instruction and structure of assessments), platform (including the online platform for lectures and discussion), and workload (including assignments and assessments). "Other" was included to capture comments not easily grouped under any one of the above. The other 2 questions were asked on the preferences of live or recorded lectures and preferences of interactive platforms.

Preparedness domain questions (total of 3 questions) evaluated if the students were well-prepared to join the course through online learning and their preparedness in terms of their background knowledge and technical skills were collected. Attitude domain questions (a total of 3 questions) were more than preparedness questions to capture either the positive or negative student experience pertaining ODL. The questions include the students' perceptions regarding the quality of the online learning, and their preferred online learning platform.

There was also a question about the content delivery (recorded or live lecture sessions) in this course. Barriers domain questions (a total of 2 questions) addressed the anticipated barriers that might be faced by the students throughout this new emerging experience. These barriers were related to the ODL experiences acquired during the pandemic outbreak. The concern was to motivate students to get into the experience and to adapt to unexpected changes.

## 2.5 Statistical analysis

Independent samples t-test was used to compare the mean difference between gender. A P-value of less than 0.05 is considered statistically significant.

## RESULTS

### 3.1 Participants' characteristics

The survey was distributed to 186 third-year pharmacy students. A total of 137 responses were received, accounting for a response rate of approximately 73%. Participants' characteristics are presented in Table 1. Female students represented 88.3% which is consistent with their overall percentage in the BPharm third-year student's population in the faculty (87.1%).

**Table 1. Characteristics of participation**

Gender	N (%) = 137
Male	11.7
Female	88.3

### 3.2 Preparedness of pharmacy students towards the course

The preparedness score was calculated from the sum of each question's answer score (all 3 questions). Average scores  $\pm$  standard deviations of students' preparedness level toward online teaching at the pharmacy school are presented in Table 2. The preparedness scores ranged from 8 to 15 with an average score of  $13.04 \pm 1.59$ , around 86.7% of a

perfect score of 15. Preparedness scores for both females and males were almost similar where the average females' score was  $12.99 \pm 1.62$  and the average score of  $13.44 \pm 1.36$  for male students, while there was no significant difference in the perceived preparedness level between males and females ( $P = 0.201$ ).

**Table 2. Preparedness, attitudes and barriers faced by pharmacy students toward online learning.**

Gender	Preparedness Score*	Attitudes score**
Male	$13.44 \pm 1.36$	$8.88 \pm 0.96$
Female	$12.99 \pm 1.62$	$8.40 \pm 1.16$

\*Preparedness Score: Score made up of the average answers for 3 preparedness questions. The answers ranged from 1-5.

\*\*Attitude Score: Score made up of the average answers for 2 attitude questions. The answers ranged from 1-5. *te* \* Attitudes score\*\* Barriers \*\*\*

### 3.3 Attitudes of pharmacy students toward online learning

Attitude score was calculated from the sum of each question's answer score (2 questions). The average scores  $\pm$  standard deviations of students' attitudes level toward online teaching at the faculty are presented in Table 2. The attitude scores ranged from 6 to 10 with an average score of  $8.46 \pm 1.14$ , about 84.6% of a perfect score of 10. There was no significant difference in the level of the attitude between female and male students, ( $P = 0.457$ ).

### 3.4 Barriers experienced by pharmacy students towards online learning

Barriers were assessed based on the keywords identified (2 questions). The students responded to the questions asking what contributed to their satisfaction or dissatisfaction with ODL and were tabulated. Based on the keywords, 'online course structure' ranked highest, followed by 'interaction' and 'online learning platform'. For those who were dissatisfied, the most common reason given was also 'course structure'. The remarks were mostly due to the assignments



given in this course and the fact that other courses were overlapping in deadlines, proving too much to handle for some students. Those who were dissatisfied also listed the inconvenience of the remote learning approach where PBL sessions via the platform used and the online midterm exam conducted had negative feedback.

The online course structure was the greatest factor influencing students' satisfaction, representing 51.8% of the total 137 respondents expressing satisfaction. Concise lecture notes to complement the lectures were part of the reasons for their satisfaction with the online course structure. Also, the students enjoyed the use of various styles of teaching with animations and colourful slides for clarity.

Interaction with the lecturers was ranked second (19.7%), mostly due to the ability of the lecturers to connect with the students i.e. interactive sessions, during the tutorial and PBL discussions that were conducted via Google Meet and Padlet. Short quizzes before and after lectures are also commended as a recap session for them on the particular subject. The positive interaction was primarily established with the instructors using platforms such as Google Forms and Quizizz. Most students preferred Google Forms (27.7%) compared to Quizizz (0.8%), whilst the rest (65%) of the learners enjoyed both platforms. Most of the students welcomed the initiative of using the two platforms for a better understanding of the subject in the form of a quiz.

The convenience of the learning approaches was ranked third, accounting for 18.2%. The lecturers were creative in conveying the information needed for the course in the ODL mode. Most of the students favoured recorded lectures with 58.2%, 5.1% preferred live lecturers and 43.1% do not mind either way. As for the preferences of online platforms, the students were allowed to choose more than one answer. Overall, the students chose Google Classroom representing 92.7%, followed by Google Meet (69.3%), YouTube (68.6%), Webex (60.6%), Padlet (50.4%) and Microsoft Teams (9.5%). The remaining remarks were classified as "Other," representing 3.6%. "Other" included satisfaction with the coordination of the course. Motivation and tips to study for exams posted on the announcements at Google Classroom were also mentioned. The learners felt the motivation

helped them throughout the semester. Only 1 student did not leave any remark.

Conversely, the course structure was also the main factor affecting the students' dissatisfaction, indicating about 46% of the total 137 correspondence. The learners expressed dissatisfaction with the course content and the clarity of the delivery of the lectures. The inconvenience of the ODL approach was ranked second on the dissatisfaction factor, accounting for 12.4%. The dissatisfaction is with regards to the assignments and assessments conducted throughout the semester. Furthermore, they expressed their discontent with the time given to complete their online assessments (midterm exam) which were insufficient. Lack of communication with the instructor and classmates also added to the dissatisfaction. Being remotely isolated from the educational environment caused frustration among the students as they were not able to communicate with other students and have a direct connection with the lecturers. The learners complained about the workload, indicating 5.8% of the total 137 comments. Overlapping assignments given from other courses were said to have increased their workload unnecessarily and should be revised. Dissatisfaction with the platform used accounted for another 1.4%. The remaining remarks were classified as "Other," representing 10.2%, including dissatisfaction with the internet connection at home, the current situation where the students are not able to be physically at the faculty and their exasperations towards their midterm exam marks. Approximately 21.9% of the learners did not state any barriers towards ODL in this subject.

**Table 3. Barriers faced by pharmacy students toward online learning.**

Factors	Male		Female		Male		Female	
	N	%	N	%	N	%	N	%
	Satisfaction				Dissatisfaction			
Interaction	4	28.6	23	18.7	0	0	0	0
Convenience	0	0	25	20.3	1	7.1	16	13.0
Structure	7	50.0	64	52.0	8	57.1	55	44.7
Platform	3	21.4	5	4.1	0	0	2	1.6
Workload	0	0	0	0	0	0	8	6.5
Others	0	0	5	4.1	3	21.5	14	11.4
No comments	0	0	1	0.8	2	14.3	28	22.8

### 3.5 Areas of development necessary for e-learning

Students identified certain areas of development as necessary needs for ODL. The question associated with this is open-ended. The majority of the students (~85%) felt that the content delivery was adequately given with various platforms used to enhance understanding and engage students' attentiveness. Approximately 19.7% of the students wanted fewer assignments given, as their optimism towards ODL was affected due to the increasing workload. This is despite the fact that the course structure was revised based on the student's learning time requirement instructed by the accreditation body (Malaysia Pharmacy Board and Malaysia Qualification Agency). The students wanted more time for them to answer the exam questions that were conducted online as most of the questions were open-book questions.

### 3.6 Survey questions analysis

The number of students who answered each of the survey questions was evaluated and the percentage of students who answered questions by "agree or strongly agree" as well as "disagree or strongly disagree" in both domains of preparedness and attitude are shown. The barriers domain were assessed based on open-ended questions. The results indicated that about 94.9% of the students agreed that the Faculty of Pharmacy, UiTM was well-prepared and ready for online learning, necessitated by the complete transition into online education as a result of the COVID-19 pandemic. The results also indicated that more than 86.9% of the students showed positive attitudes toward the provided

ODL during the COVID-19 pandemic. Finally, the results indicated that about 83.9% of the students identify some difficulties with the ODL implementation during the COVID-19 pandemic. However, about 16.1% of the students did not identify any hindrance.

## **DISCUSSION**

Distance learning is an educational process where students receive instruction through online classes, video recordings, video conferencing, or any other audio/visual technology medium. It enables people to receive an education without having to be physically present in a classroom (Cole et al., 2014; Ferri et al., 2020; Mohamed Ibrahim, 2018). ODL was adopted by almost all teaching institutions worldwide, including Malaysia during the COVID-19 pandemic (Al-Kumaim et al., 2021; Allam et al., 2022; Stawicki et al., 2020). There were many challenges faced in implementing remote learning i.e. technological, pedagogical and social challenges (Ferri et al., 2020). The technological challenges are mainly related to the slow and unreliable internet connections and the lack of necessary electronic devices for the students to utilise (Ferri et al., 2020; McKie, 2020). This may cause the students the ability to access higher education from home due to their “digital poverty”. The pedagogical challenges are mostly associated with lecturers’ and students’ incompetency in digital skills, the lack of structured content versus the abundance of online resources, students’ lack of interaction and motivation and lecturers’ shortage of pedagogical content knowledge needed for online teaching (Browning et al., 2021; Ching et al., 2018; Ferri et al., 2020; Seymour-Walsh et al., 2021). The social challenges are mainly related to the lack of human interaction between lecturers and students as well as among students, inadequate physical spaces at home to receive lessons (lack of access to a quiet space to study) and the lack of support of parents who are frequently working remotely in the same spaces (Ferri et al., 2020; McKie, 2020).

The good preparedness scores were as expected since both students and faculty have very good knowledge and skill to handle a computer and are familiar with many online applications for online education such as Google Classroom®, which has been used as the main learning management system (LMS) at the university. In addition, this is the year where students start

taking and end up finishing the largest number of therapeutic courses which are heaviest on content than other courses in the BPharm study plans. It is interesting that although the course contains two practical sessions, there were no remarks made on the activity. This indicated that the delivery method of the practical sessions was effective. The lecturer used live demonstration sessions in addition to other pre-recorded demonstration videos and PowerPoint® presentations. Even though the majority of the students showed satisfaction in the ODL online learning, they expected 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, and the lack of such interaction undermines student learning and reduce their motivation levels (Almetwazi et al., 2020; Cole et al., 2014; Shawaqfeh et al., 2020). However, most students preferred recorded lecture sessions so that it will be easier for them to rewind and repeat the lectures anytime they want. A study done in Korea showed that pre-recorded video lectures are preferred to live ZOOM lectures due to their flexibility, convenience, and educational effectiveness (Maidul et al., 2020). Video lectures for the initial delivery of knowledge would be very effective and may have importance equal to that of face-to-face lectures (Brockfeld et al., 2018). However, face-to-face lectures may prove to be more effective as they provide more structured learning schedules and help the students to better manage their workload (Mayer, 2001; Ranasinghe & Wright, 2019). Hence the need to implement strategies to ensure the ongoing effectiveness, efficiency and engagement of lectures transitioning from face-to-face to online delivery (Seymour-Walsh et al., 2020). The suggested strategies are innovative cognitive learning theory, promoting learner engagement and minimizing distraction, and application of available online software to support active learning. This will enable lecturers to navigate the challenges of lecturing in an online environment and plan fruitful online lectures during this disruptive time (Seymour-Walsh et al., 2020). This was mentioned by the students when a few lecturers were commended for their use of new technology such as Genially, an online tool to create an interactive and animated presentation. The use of YouTube was also beneficial to the students as this platform transcribe the recorded video to text.

Among the challenges that the participants of the current study agreed on was the increase in academic workload posed by the ODL during the pandemic

This is supported by a study done where the students are experiencing enhanced academic workload, anxiety due to separation from school, and fears of contagion that led to stress (Son et al., 2020; Yang et al., 2021). The participants of this survey felt that overlapping assignments from other courses at a similar deadline drove them to unnecessary stress that may affect their interest in the subjects they enrolled. A heavier workload causes students to adopt surface approaches as a shortcut, and memorizing without thorough understanding (Cheung et al., 2020). It was found that overloaded students experience higher levels of stress and more physical problems like sweating, headaches, exhaustion, stomach problems, and/or sleeping difficulties. Heavy academic workloads can create a feeling of nervousness and anxiety that can cause stress and can affect students' mental health if prolonged (Abracero et al., 2021; Kausar, 2010; Rahim et al., 2016). A study has suggested that tests and assignments should be scheduled at intervals to avoid giving those tests and assignments at the same time as this will become burdensome and stressful to the students (Aam et al., 2017).

Other challenges included mainly technical problems, lack of motivation by some students toward virtual learning, information overload, "mind-wandering" and maintaining long-term focus through the teaching session. This is in an agreement with studies that have evaluated the challenges and barriers faced by students during their ODL process (Shawaqfeh et al., 2020). As mentioned before, the challenges and problems faced during online learning in healthcare professional education can be overcome by following several effective measures such as implementing solid strategies to improve student engagement and reduce distraction, and applying the cognitive theory principles that can help to make the online learning experience more fruitful, subsequently meeting the expected learning outcomes (Shawaqfeh et al., 2020; Stawick et al., 2020). According to Cole et al. (2014), student-instructor interaction and learner-content interaction are very important as onground classroom, a synchronous education platform, allows the student to have questions answered and for the lecturer to elaborate on points to be made at the time the student is having trouble. This onground classroom can have a mix of online and onground sessions. Also, interaction with other students contributes to the sense that there is a community of learning and provides additional support for the student to expand his or her understanding of the material that provides biological as

well as affective significance (Cole et al., 2014; Darling-Hammond et al., 2020). Such relationships help develop the emotional, social, behavioral and cognitive competencies, vital to learning (Darling-Hammond et al., 2020). Thus, motivational inputs from the lecturers are important to boost the morale of the students to perform better despite the current situation as motivational strategies shape students' learning environment (Hornstra et al., 2015). This was remarked by the students on the gesture made by one lecture that always shares motivational quotes and encouragement throughout the semester. Many of such obstacles could be overcome through the adoption of several measurements. This is generally valid for theoretical courses where online learning can be of comparable quality to traditional learning. Depending fully on online methods for practical and experiential learning of health professions students is a very challenging perspective as students are expected to experience and apply what they learn, in real-life patient care situations.

However, it should be recognized that educators are under huge pressure to provide tertiary and ongoing professional development online amidst varying levels of physical isolation requirements and combined with soliciting innovative approaches to gauge students' attention (Seymour-Walsh et al., 2020). The new 'normal' that may emerge from such an environment has the potential to revolutionize education for regional, rural and remote students, clinicians and educators. Moreover, the delivery of ODL need not reduce the quality of educational design and need not be reduced to a uni-directional transference of knowledge by means of didactic monologue. Hence, it is recommended that lecturers should consider: 1) questions and images to stimulate thought and encourage problem-solving; 2) gathering real-time input from students by text-based chat or audio responses; 3) planning small groups discussions to supplement what has already been addressed in the lecture; 4) exercises that enable students to identify their individual and corporate gaps before or after the lecture; 5) providing resources to review previous learning, retrieving existing knowledge and adapting existing schemata to the new content; 6) reducing the volume of new information to align to potential reductions in learners' cognitive reserves (Seymour-Walsh et al., 2020).

The dissemination of the survey was done due to the nature of the pandemic on a core subject in the third-year study of the undergraduates. As a result,

there is a possibility that relevant COVID-19 environmental factors might affect the quality of responses like fear, anxiety, uncertainty or frustration towards the pandemic outcome. The questionnaire was easy to answer, however more questions in each domain might be considered to portray a more comprehensive assessment. This survey could also be extended to other higher learning institutions in Malaysia that offer the same course. 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 faculty's and their own preparedness for distance learning, their attitudes toward the online learning experience during the period of COVID-19 outbreak and rapid adoption of fully online instruction for this subject, Pharmacology of CNS Drugs. Also, the study evaluated and identified the barriers perceived by the students towards ODL. Addressing these issues is expected to help in the continuous quality improvement of online learning as students progress into the coming academic years. This is especially important as ODL platforms might be the only available mode of learning and teaching that can ensure learning continuity during disasters such as the COVID-19 outbreak. This study revealed a positive attitude by pharmacy students in UiTM on online learning. Also, students have positively perceived the institution, instructors, and their preparedness for online learning. Most of the students were satisfied with the online learning experience during the university's lockdown due to COVID-19. This study evaluates real-life students' experience at a pandemic outbreak to identify areas that might need improvement. Effective ODL in the health professions education has become a necessity and continuous development of ODL approaches should be pushed forward to maximise improvements for future development of health professional education and online learning delivery.

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