WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Confidence Level in Pharmaceutical Care Skills and Experiences Using MyDispense Virtual Simulation Among Pharmacy Students in The Philippines

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DOI: https://doi.org/10.55248/gengpi.4.623.45486

A B S T R A C T

MyDispense®, developed by the Faculty of Pharmacy and Pharmaceutical Sciences at Monash University, aims to provide accessible learning and drug dispensing practice to students. Virtual simulation has become a widely used technology, especially while the educational sector is slowly recovering from the pandemic. This study aims to determine the confidence level in pharmaceutical care skills and experiences using MyDispense® on prescription handling and patient counseling. This research utilized Quali-Quanti Sequential Exploratory mixed methods among pharmacy students in the Philippines enrolled in a MyDispense® curriculum. A total of 324 students completed the two-part survey analyzed with frequency, percentage, and a chi-square test. Eight students located in different parts of the Philippines participated in the interview, which was analyzed using thematic analysis to determine the advantages, barriers, challenges, and recommendations. The results showed that the respondents mainly were third-year students (40.4%), completed 10 and above MyDispense® cases (49.7%), resided in region XI (48.8%), and utilized laptops in accessing the virtual simulation (67.9%). A high level of confidence in pharmaceutical care skills was expressed in the mean values of prescription handling skills (4.31) and patient counseling skills (4.31) revealing that MyDispense® is an essential pharmacy simulation tool. The qualitative results showed that MyDispense® provided experiential learning beneficial for work-based education. It gave the students confidence in their prescription handling skills by activating their critical thinking through delivering patient-centered care in a timely manner. For patient counseling skills, it enhanced the students' own communication style in written form which gave them confidence in interacting with virtual patients. Students encountered various challenges, such as technical and language barriers, which led to the suggestion of a customizable dispensing system. Thus, MyDispense® is a viable platform for practicing pharmaceutical care that provides meaningful features for the growth of students as confident future pharmacists.

Keywords: Pharmacy students; Level of Confidence; Virtual Simulation; MyDispense; Philippines

1. Introduction

Globally, medicines are considered an essential health resource in all aspects and levels of healthcare (1). Pharmacists play a crucial role in safely and accurately dispensing medicines (2) ; hence, Pharmaceutical Care standards ensure that pharmacy services are provided to establish patient welfare (3) . Dispensing is a core skill in pharmacy practice; it demands the knowledge and discipline associated with medicine (4). Therefore, adequate resources, equipment, and specific information must hone this skill to facilitate students' self-regulation and professional growth (5). COVID-19 caused an unprecedented distraction in pharmaceutical training and clinical exams (6) as online learning has opted during the crisis; however, this shift imposes a significant challenge (7). Fortunately, traditional and face-to-face assessment of skills endeavored through MyDispense, a software program that virtually stimulates the dispensing process, created by Monash University in Australia and adopted by numerous institutions worldwide (8). The virtual simulation enables students to practice the dispensing skills of a pharmacist in a web-based and readily accessible environment (9). The 2016 Accreditation Council for Pharmacy Education update reaffirms medication use system management as a vital part of pharmacy practice; specifically, pharmacy graduates should be "able to manage healthcare needs by using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems" (10). A recent study concluded that MyDispense improves and enhances community pharmacy skills. It was shown that a virtual simulation program is a functional tool that effectively teaches and prepares students for practice in a community and hospital setting. Although simulations cannot replicate the complexities of human behavior and interactions, students felt less equipped to counsel patients. The clinical knowledge was also poor because of the lack of experience with conventional exams (11). Thus, technological innovations are necessary for pharmacy education to remain robust despite challenges beyond the pandemic (12). No current reviews or articles have been published on MyDispense in the local area and the Philippines. Additionally, the scarcity of modern equipment and lack of laboratories is reflected in the quality of science and medical education quality. There is a need to address this situation by expanding and strengthening software that will facilitate effective instruction and reverse the backward technology of the country (13). Therefore, it is essential to determine the level of confidence in their pharmaceutical care skills of students in dispensing

and understand their experiences with using MyDispense (9,14). As mentioned in the Philippine Pharmacists Association, the skills in community and hospital practice include providing quality medicines and other health products appropriate to the patient's needs and counseling clients or patients on the safe and judicious use of drugs and other health products (15). This research aims to determine the confidence level in their pharmaceutical care skills and analyze the students' experiences using MyDispense as an alternative learning tool that will support the practice of their clinical knowledge and dispensing skills. The researchers would like to help in identifying the virtual simulation's advantages and challenges, as well as the learners' recommendations that might aid in the update of this experiential program in improving features that can further increase their skills in dispensing as preparation in the actual application, which is the ultimate goal of this virtual simulation.

2. Methods

2.1 Study Design

The exploratory sequential design is a mixed-method design in which the qualitative and quantitative phases of data gathering and analysis are conducted sequentially (123). This model is utilized in cases wherein the researcher gathers and analyzes qualitative and quantitative data on the same event independently in this paradigm, and then the varied findings are combined during the interpretation. Therefore, the chosen model is appropriate in seeking to compare data or validate, confirm, or corroborate quantitative findings with qualitative results to arrive at valid and well-supported findings in this study.

2.2 Subject Participants

The participants in this study were second-year, third-year, and fourth-year pharmacy students in the Philippines enrolled during the S.Y. 2021-2022. Firstly, participants are students from a college or a university with a MyDispense URL who completed the pharmaceutical dispensing subject. Secondly, a regular Filipino or an international student 18 years old and older; can be a repeating student but must not have a failing grade. Thirdly, they can be "second-coursers" or those who took up a bachelor's degree, graduated or shifted, and then enrolled in B.S. Pharmacy. Fourthly, an official MyDispense user and has completed three or more MyDispense cases. Lastly, they have a stable internet connection with at least 8 Mbps. For the exclusion, firstly, a student who has not yet experienced MyDispense and is not an official MyDispense user or does not have a MyDispense account completed below three MyDispense cases. Next, a 1st-year student with no background in pharmaceutical dispensing subjects, an irregular student, and not a bona fide student or not enrolled in any pharmacy school in the Philippines with MyDispense URL.

2.3 Data Collection Procedures

The survey questionnaire utilized in this study was adapted from the article from the Journal of College Student Development and BMC Medical Education (17,18). The quantitative survey questionnaire includes two parts with a total of twenty questions. The first part of the questionnaire contains six questions about the respondents' socio-demographic backgrounds, while the second part includes twenty statements that are based on the two (2) pharmaceutical care skills, which are Prescription Handling skills and Counseling skills. The chosen respondents were asked to rate the statements according to the description that suited their condition, employing the five-point Likert scale system, with one (1) strongly disagree and five (5) strongly agree.

The qualitative semi-structured guide questionnaire contains ten questions about pharmacy students' experiences, such as the advantages, barriers, and challenges, and recommendations they experienced in acquiring dispensing competencies using MyDispense through one-on-one in-depth interviews on Zoom meetings. The pilot testing that was conducted on 40 to 50 random students was given to test the relevance and precision of the survey questions. The reliability and validity of the survey form were tested using the Alpha Cronbach. The semi-structured interview took 15 to 20 minutes to answer all the ten questions, while the survey questionnaire took 5 to 10 minutes.

2.4 Data Analysis

Following the data collection of descriptive statistics, the frequency and percentage were used for the respondents' socio-demographic profile in terms of year level, location, and device or gadget. Meanwhile, the confidence level of pharmacy students in their pharmaceutical care skills on utilizing MyDispense in prescription handling skills and counseling skills was determined using the mean. The level of interpretation for the mean value is 1.0 - 1.80 (very low), 1.81 - 2.60 (low), 2.61 - 3.40 (moderate), 3.41 - 4.20 (high), and 4.21 - 5.00 (very high) [19]. The Pearson Chi-square Test for Independence was used to determine if there is a significant relationship between the socio-demographic profile and the confidence level of pharmaceutical care skills using MyDispense. Thematic Analysis was used in determining the experiences in the advantages, barriers and challenges, and recommendations that pharmacy students encountered in developing their pharmaceutical care skills through MyDispense. As established from the different results of the quantitative and qualitative analysis, a Joint Display will be utilized wherein the quantitative and qualitative results will be merged to understand the study's complexity better.

3. Results and Discussion

3.1 Socio-demographic Profile

An expected total of three hundred eight-five (385) pharmacy students from Luzon, Visayas, and Mindanao were requested to take part in the study and complete the survey, yet, only three hundred twenty-four (324) pharmacy students answered the survey completely for an 84.16% response rate. As specified by the demographic characterization of the respondents, most of those with previous experience using MyDispense are third-year students, which accounts for 40.4% of the total, and these individuals have completed more than ten tasks within the MyDispense program. The bulk of users in the Philippines, 48.8 percent, come from Region XI. These users primarily utilize personal computers as their access devices (67.9 percent).

Table 3.1 - *Socio-demographic Profile of Students*

Segmentation	N	Percentage (%) Distribution
Year Level		
Second Year	127	39.2
Third Year	131	40.4
Fourth Year	66	20.4
Number		
1-3	37	11.4
4-6	78	24.1
7-9	48	14.8
Ten and above	161	49.7
Region/Location		
NCR	35	10.8
CAR	12	3.7
I	8	2.5
III	4	1.2
IV	11	3.4
V	2	6
VI	4	1.2
IX	3	0.9
X	4	1.2
XI	158	48.8
XII	54	16.7
XII	14	4.3
BAR	15	4.6
Gadgets	3	0.9
Cellphone	37	11.4
Desktop computer	2	0.6
Desktop computer, Cellphone	1	0.3
Desktop computer, iPad, or Tablet		
Desktop computer, Laptop	16	4.9
Desktop computer, Laptop, Cellphone	2	0.6
Desktop computer, Laptop, iPad, or Tablet	3	0.9
iPad or Tablet	7	2.2
Laptop	220	67.9
Laptop, Cellphone	22	6.8
Laptop, iPad, or Tablet	8	2.5
Laptop, iPad or Tablet, Cellphone	3	0.9
Ownership		
Personal	265	81.8
Family-Owned	31	9.6
Borrowed	4	1.2
Personal, Borrowed	2	0.6
Personal, Family-Owned	20	6.2
Personal, Family-Owned, Borrowed	2	0.6

3.2 Confidence Level in Pharmaceutical Care Skills

In the second section of the survey tool, respondents were asked to rate a statement on a five-point Likert scale, one representing “strongly disagree” and five representing "strongly agree." Each factor of the Pharmaceutical Care Skills evaluation (Prescription Handling Skills and Patient Counseling Skills) comprises ten (10) statements that describe various situations based on the aspect. Twenty statements were prepared in total by the researchers.

The confidence level in terms of patient counseling skills obtained an overall mean score of 4.31, which is described as high in the interpretation matrix used. This entails that the respondents agreed with the statement that MyDispense virtual simulation makes it easier for them to counsel, inform, provide, and educate their patients. The respondents also feel they can provide relevant information as needed in the counseling area for MyDispense. According to the survey findings, the vast majority of people who use the MyDispense program have acquired the fundamental skills necessary for prescription management and counseling. The results indicated that the overall mean value for both measures was 4.31, which corresponds to the descriptive equivalent of "high." This suggests that students have built their skills and confidence in the safest and most effective methods of distributing pharmaceuticals through the highly interactive dispensing activities provided by MyDispense. Therefore, MyDispense is an online pharmacy simulation that allows students to acquire and hone their dispensing skills via practice. It offers a protected setting where kids may experiment with making mistakes without the risk of encountering the severe repercussions of practicing in the real world. Students can increase their skills and confidence in the safest, most effective methods of distributing pharmaceutical items by using the MyDispense software, which has highly interactive exercises in product distribution [57].

Table 3.2 - *Mean Confidence Level of Pharmacy Students in their Patient Counseling Skills using MyDispense in the Philippines*

Item		Mean	SD	Description
1.	I am able to counsel the patient in terms of their medication-related needs in a structured and logical manner through MyDispense.	4.29	0.7219	High
2.	I am able to provide the client/patient with current, objective, and evidence-based information in MyDispense.	4.27	0.7416	High
3.	I can utilize communication methods to ensure that counseling is effective with the patient through MyDispense.	4.17	0.7928	High
4.	I can inform patients about the dosing regimens, precautions, potential adverse effects, storage requirements, and proper disposal in MyDispense.	4.39	0.7186	High
5.	I am able to educate patients about disease prevention and awareness through MyDispense.	4.17	0.8259	High
6.	I am able to respond and provide accurate and relevant answers to the patient’s questions through MyDispense.	4.31	0.6922	High
7.	I am able to inform the patients about the appropriate use of medications and educate them about the side effects of poor medication adherence in MyDispense.	4.39	0.7276	High
8.	I am able to strongly advise the patient not to skip a dose of antimicrobial medication and to finish the therapy in MyDispense.	4.44	0.7247	High
9.	I am able to counsel the patient in the simplest way and ensure that they understand the medication information given through MyDispense.	4.40	0.7126	High
10.	I can address the concerns and complaints raised by the patient about the side effects of medications in MyDispense.	4.32	0.7217	High
Overall Mean		**4.31**	**0.5633**	**High**

The confidence level in prescription handling skills obtained an overall mean score of 4.31, which is described as high in the interpretation matrix. Most respondents agreed that they could check, dispense and provide essential details about the prescription. Ensuring the quality of medications is of the utmost importance to ensure safe and effective medical care and reduce the overall cost of medical care. Regarding patient care, safe medication dispensing, correct dosage, and secure storage are all critical aspects of medication management. Furthermore, the simulated environment resulted in a significant number of achievements from students in terms of taking the initiative to acquire knowledge in the mastering of simulated cases, which enhanced students' innovative abilities [57].

Table 3.3 - *Mean Confidence Level of Pharmacy Students in their Prescription Handling Skills using MyDispense in the Philippines*

Item		Mean	SD	Description
1.	I am able to counsel the patient in terms of their medication-related needs in a structured and logical manner through MyDispense.	4.29	0.7219	High
2.	I am able to provide the client/patient with current, objective, and evidence-based information in MyDispense.	4.27	0.7416	High

3.	I can utilize communication methods to ensure that counseling is effective with the patient through MyDispense.	4.17	0.7928	High
4.	I can inform patients about the dosing regimens, precautions, potential adverse effects, storage requirements, and proper disposal in MyDispense.	4.39	0.7186	High
5.	I am able to educate patients about disease prevention and awareness through MyDispense.	4.17	0.8259	High
6.	I am able to respond and provide accurate and relevant answers to the patient's questions through MyDispense.	4.31	0.6922	High
7.	I am able to inform the patients about the appropriate use of medications and educate them about the side effects of poor medication adherence in MyDispense.	4.39	0.7276	High
8.	I am able to strongly advise the patient not to skip a dose of antimicrobial medication and to finish the therapy in MyDispense.	4.44	0.7247	High
9.	I am able to counsel the patient in the simplest way and ensure that they understand the medication information given through MyDispense.	4.40	0.7126	High
10.	I can address the concerns and complaints raised by the patient about the side effects of medications in MyDispense.	4.32	0.7217	High
Overall Mean		**4.31**	**0.5633**	**High**

3.3 Test of Relationships

For the test of relationships, the Pearson chi-square test was used to determine whether the socio-demographics have a significant relationship or not with the two (2) domains. Table 3.4 displays the test result on the association between the socio-demographic profiles and the confidence levels in Pharmaceutical Care Skills of Pharmacy Students. In terms of the Prescription Handling Skills and their link with the socio-demographic profiles [year level ($p = 0.053$), cases of MyDispense completed ($p = 0.497$), location/region ($p = 0.757$), type of gadget use ($p = 0.440$), and ownership of the device ($p = 0.053$), the results in the table demonstrate no significant association with the factor as mentioned above. Therefore, the socio-demographic factors have no significant relationship with Prescription Handling Skills.

Meanwhile, in terms of Patient Counseling Skills and their relationship with the socio-demographic profiles [year level ($p = 0.556$), cases of MyDispense completed ($p = 0.059$)), location/region ($p = 0.389$), type of gadget use ($p = 0.056$), and ownership of the device ($p = 0.996$)], it shows that there is no significant relationship with the aforementioned factors. Thus, the students' Patient Counseling Skills in MyDispense cannot be influenced by the aforementioned demographic profiles. Students' demographic profiles and pharmaceutical care abilities using the MyDispense program were subjected to statistical analysis. The results showed no significant association between the two ($p > 0.05$). Hence, the null hypothesis indicates no important relationship between students' demographic profile and pharmaceutical care skills when using the MyDispense application is accepted.

Although researchers have reported that socio-demographic profiles of students can have an impact on their virtual learning and performance, the results have shown that pharmacy institutions that apply online modalities of learning, such as the MyDispense virtual simulation, should instead give importance to variables that can be controlled [22] . As the emergence of realistic alternatives to learning rose in the pandemic, pharmacy institutions should adequately introduce current developments in the field of pharmacy practice [10] as well as include national standards for GPP [47]. The current pandemic caused by COVID-19 may be a contributing factor of the negative associations depicted in the test of relationships as the researchers experienced a challenge in terms of reaching out to the identified institutions hence, the results should be interpreted cautiously.

Table 3.4 - *Summary on Significant Relationship between the Socio-demographic Profile and Pharmaceutical Care Skills of Pharmacy Students using MyDispense*

Socio-Demographic Profile					
	Year Level	Cases of MyDispense Completed	Location/Region	Type of Gadget use	Ownership of the device
Prescription Handling Skills	0.053	0.497	0.757	0.440	0.053
Patient Counseling Skills	0.556	0.059	0.389	0.584	0.996

**P-values below 0.05 show a significant association between a variable and a factor.*

3.4 Advantages, Disadvantages, and Barriers, Recommendations

Experiential Learning

Virtual simulations, such as MyDispense, replicate realistic circumstances on a gadget to facilitate learning by being able to experience drug dispensing in a secure environment for students to develop a wide range of practical skills needed in the community and hospital setting. MyDispense is an example of a virtual dispensing simulation; it is a web-based software program that stimulates the dispensing process in a community pharmacy [58].

Learning Efficiency

In a previous study, most students agreed or strongly agreed that MyDispense was accessible to learn [20] because the users claimed that MyDispense is very accessible and easy to use [21]. The virtual simulation enables students to practice the dispensing skills of a pharmacist in a web-based, readily accessible environment [9]. Internet-based e-learning or simulation like the MyDispense has been reputed to have increased educational accessibility, improved self-efficacy, and knowledge development, cost efficiency, learner flexibility, and class engagement [22].

"One thing that I have remembered about MyDispense is that it is easy to navigate." [P1]

With this, MyDispense enables students to practice the dispensing skills of a pharmacist in a web-based and readily accessible environment [9]. Internet-based e-learning, on the other hand, has been reputed to have increased educational accessibility, improved self-efficacy, knowledge development, cost efficiency, learner flexibility, and class engagement [22].

"Easy to access because online." [P7]

"It's accessibility. Anyone with a desktop or Laptop can access MyDispense. That it gives everyone the same opportunity to practice counseling, prescription reading, and everything related to pharmacy practice - which is not deprived because of the pandemic." [P2]

Life-like environments aid in stimulating the dispensing process needed in pharmacy practice, which creates efficient opportunities for the students to learn despite physical limitations [6]. In a study, many students said it was more realistic than dealing with equivalent paper instances, which also provided a safe environment in incidents wherein mistakes were made. MyDispense allows students to practice gathering patient information and asking appropriate questions, counseling patients, and filling prescriptions [20]. Simulated learning and teaching settings provide students with a realistic alternative for developing pharmaceutical care skills. The pharmaceutical community setting is mainly replicated in MyDispense, which earned feedback from the participants.

"Of course, because this will give you the community setting." [P5]

"It was really a help because it will give you an idea of what to expect in real and actual life." [P4]

"Like even though I am not in a physical setting, it would be really fun for me to have a community pharmacy experience with regards to MyDispenses." [P1]

In community pharmacies, the pharmacists should be able to recognize drug therapy-related problems (DTRPs) in prescriptions and lessen the problem by relaying with the prescriber. Also, it is essential to collaborate among physicians and community pharmacists to identify the DTRPs and the safety culture practices [23]. Community pharmacists are the ones who scan the prescription, identify problems, and endorse drug interventions and will be able to resolve the problem in the prescriptions [24].

"In fairness, I have gained learnings like in handling patients. I also gained knowledge about drug effects, effects of drugs when taken together." [P7]

"They get to have this knowledge about asking the patients, knowing the prescriptions, knowing the interactions, as well as knowing if they have given the proper medication and the proper dosage with ancillary labels." [P1]

"MyDispense was able to help enhance my skills and recall the lessons of my pharmacology and other subjects." [P8]

Content and Work-based Learning

It was found that MyDispense helped the majority of the students know about the necessary steps in dispensing in the entire field [25]. It also enabled students to practice gathering patient information and asking appropriate questions, counseling patients, and practicing the dispensing process [20]. According to a report, students who used MyDispense showed greater confidence in using technology to improve their communication. It allowed them to have an excellent dispensing practice experience engaging with virtual patients with practical scenarios on a professional and ethical level before working with actual prescriptions and dealing with real-life patients [21]. Incorporating technology into teaching was recognized and embraced, an area strengthened by this pandemic [26]. In addition, this opened institutions and educators to new, innovative, and better learning opportunities for pharmacy students to impact community practice [27]. Moreover, MyDispense adopted measures that better users' practice for simulation-based education, including feedback, integration of curriculum, and measurement of outcome, acquisition, and skill maintenance [25].

"I think the MyDispense app has been very helpful in introducing dispensing practice for my course." [P6]

"MyDispense has helped me improve my skills in dispensing medication for patients." [P8]

"We get to practice the whole process of dispensing and our speed in efficiently dispensing medications. " [P6]

"It helps us in properly learning the correct process of dispensing." [P6]

Effective communication between patients and providers was found to significantly impact patient adherence to treatment and drug selection [28]. Communication skills improve the quality of healthcare outcomes. The communicative relationship between pharmacists and patients is fundamental to the pharmaceutical profession [29]. Pharmacy study provides adequate training to develop their effective communication styles. Practicing these skills is essential to the clinical rotation experience [30]. Hence, MyDispense helps students hone their counseling skills because students who completed MyDispense exercises observed that they are better prepared to provide medication counseling compared to students who did not complete MyDispense practices [31]. MyDispense, according to a published study, observed students' self-reported confidence and involvement in using a paper-based model versus a simulated patient case. Compared to a paper-based patient case, their students believed that the simulated patient case improved their skills and resulted in enhanced enjoyment; agreed by many students, realism is also a good feature stated by a handful of responses, and learning of new knowledge [32].

"It helps sharpen one's skills in counseling the patients. Also, you can practice your style of counseling." [P2]

"It's also a good tool for pharmacy students who are introverts like me, and I have difficulty interacting with other people." [P7]

"For patient counseling, you were given references, so it gives you the analytical thinking of summarizing your references and turning it into layman's terms for your virtual patient to understand." [P5]

"It helped me more in counseling." [P8]

Students' perceptions of readiness were found to have substantial direct correlations with their knowledge, motivation, experience, interest, and expectations related to pharmacy practice and pharmaceutical care [33]. In line with this, one study states that one problem is the lack of information technology assistance for data collecting and documentation. In continuation of what the researchers said one of the study's findings may suggest that the slow advancement of pharmaceutical treatment in the Philippines is due to a lack of awareness and perceived barriers to successfully developing pharmaceutical care in the Philippines. Additional issues affecting the provision of pharmaceutical care must be identified [34]. With that said, MyDispense is an internationally-based simulation that can give Filipino students an overview of foreign technology and the like.

"The app is introducing like the barcode technology." [P6] "Introduction of new technology in the Philippines." [P6]

Technical Management

In a previous study, inconsistent internet connection and technological faults are faced during e-learning. Furthermore, online communications could negatively impact the students' learning experience [25].

Technical Barrier

Dispensing medication is one of the competencies of pharmacists that require access to technical information, equipment, and resources [25]. MyDispense is a virtual dispensing simulation that stimulates the dispensing process in a community [35]. However, some pharmacy students are experiencing trouble with the application's features. Virtual reality has limitations that can change the results of the studies, such as the system's latency, where the delay is combined in each step of the procedure from data assets on the patients to multimodal outputs [36]. The technical barriers can restrict the students' opportunity to have fun and feel dissatisfied with the digital world.

"We experienced that the app takes a long time loading after you click one button, while simultaneously trying to catch up with the teacher's instructions on what to do next." [P4]

"And of course, the use of the barcode technology. In my first time using MyDispense, I had a hard time on how to use the barcode technology" [P6]

Virtual simulation has technical issues such as content glitches due to poor programming and design. Furthermore, navigation issues where students have problems in navigating, such as students not knowing how to return to the menu and make selections [37].

"It's hard to maneuver. Redirect yourself to the different types of labeling." [P5] "Also, the labels are small for me as someone with a vision problem." [P8]

In the Philippines, pharmacists have a low percentage of comprehension of the concept of pharmaceutical care. The slow advancement of pharmaceutical treatment in the Philippines is due to the lack of awareness and perceived barriers to effectively developing pharmaceutical care in the Philippines [38]. A barrier experienced by the students in the application is the lack of connection between the pharmacist and the patient. Virtual simulation cannot recreate entirely real-life situations, and not every situation is included. There are no real consequences for errors that may result in the underperformance of the students and not being fully involved in the training, producing erroneous results. Pharmacists must give the best interest of their patients and treat them fairly. Effective communication between a pharmacist and a patient significantly impacted patient adherence, drug selection, and treatment [28].

"With MyDispense, it's limited to like you're just giving the medicine; you don't see the cost of the medication and the possible situation where a patient cannot afford his complete medication therapy." [P8]

"Building pharmacist-patient relationship in MyDispense, it seems to have no empathy while I give counseling and instructions. Also, you cannot monitor your patients." [P8]

One of the essential tools for e-learning is Computer-Mediated Learning (CML), computer-based e-learning [39]. The study has shown that more than half of Filipino students use remote learning technologies. Most students use smartphones, and only a few have laptops [40]. Students need an up-to-date device to use the application efficiently because they experience technical difficulties.

"I also need a laptop which can handle the functions of MyDispense, because if not, MyDispense will lag at all times" [P8]

Language Barrier

Pharmacy students begin their communication skills in their respective colleges or universities, enabling them to practice real-life situations without physical limitations [41]; this provides sufficient training to enhance their effective communication styles [30]. However, in Mydispense pharmacy, students are experiencing problems with language differences.

"And last is your language. Of course, there is always a barrier on the cultural side with different patients." [P5]

"I think one of the most obvious barriers I encountered is the language used because I am most comfortable giving patient counseling in Tagalog or my dialect." [P6]

The most common tool of communication is language. Language barriers are the fundamental cause of many problems in healthcare. In the study, patients described their experiences in terms of language barriers which contributed to delayed treatment, insufficient understanding of the patient's condition, and risk of medication errors [21]. This language barrier decreased the confidence of communication skills of the students because, according to the participants, they are more comfortable speaking their dialect; however, in MyDispense, the simulation only uses the universal language.
Customizable Dispensing System

The presentation of cases and the virtual simulation features in MyDispense were aspects that needed improvement based on the participants' experiences. With these, a study states that virtual learning has become a way to enable innovative and adaptable learning and teaching systems [42] during the COVID-19 crisis.

Development of Valuable features

The study has reported that MyDispense is immersive and realistic, which offers an active and engaging work-based experience for students [20]; however, limitations of the virtual environment have to combine with traditional methods of education to create a convenient and specialized learning experience for students [43].

"Since MyDispense is all about talking to a patient without audio like you get to type and to read what the patient is saying, a more advanced would be like an audio interaction" [P1]

"I think that the patient should move, should show emotions to catch up with what she wants to say. Or verbal cues." [P5]

"*I would advise to make it a more interactive case" [P5]*

"Maybe an option that you can make a video of yourself giving counseling to the patient. And at the same time, a video also of the patient asking questions." [P8]

Meeting the students' recommendations can aid in providing satisfaction with the digital environment and reinforce a better user interface for an advanced user experience from the platform [44], as developing patient-specific pharmaceutical care practices should be contextualized. The training of students should involve learning applications aligned with prescription handling and counseling abilities, which are concepts that may differ between countries, especially in community practice [45]. Diversity is evident in the model of practice in each country which experts state that there is a need for virtual simulations to take local circumstances into account [46]. Pharmacies are globally considered to be the most accessible healthcare service; thus, there is a need for MyDispense to be related to drug problems and common diseases in their local entry-level pharmacies [47].

"It should have an option that you get to choose the location or country that the app will adapt, to contextualize the operation of the cases in the app" [P4]

"Since I'm unfamiliar with the brands, I tediously go over each medicine to identify it." [P7]

"Stipulate scenarios that are very rampant here in the Philippines. And to include drugs commonly used here in the Philippines on the shelves." [P2]

"For some, they use, of course, in the Philippines, we have to pattern or practice in the USP-NF. Some use different guidelines, so that would be a challenge." [P5]

In connection to the previous subtheme, participants suggest adding valuable features that enable them to establish patient-pharmacist relationships as the current dispensing system simulations do not allow mimicking details of human interaction and behavior. Students feel more prepared to counsel patients when they can practice the intricacy of verbal communication [11]. The practice of pharmaceutical care aims to assist individuals in maximizing the use of their medications [48]. Hence, encouraging proper medication usage and patient education would improve health outcomes and achieve patient-centered care [49]. In addition, a study has shown that virtual simulations could cultivate realistic and practical student-centered learning for students to develop a wide range of skills, including the demonstration of medical devices [50, 51].

"I think on giving proper instructions to the patient...If you can't instruct, or correct it, the drug or medicine won't work." [P8]

One of the core competencies of pharmacists is to compound products, ensuring product quality, safety, and efficacy [52]. Preparing these medications is necessary for enhanced dispensing skills, especially in hospitals where compounding is mainly applied for in-patients [47]. A study has shown that pharmacists will be heavily involved in pill counting and packaging [53]. Compounding is now required to ensure consistent access to safe and effective medicines; hence there is a need to integrate the aspect of compounding for students to maneuver MyDispense from the pharmacist's point of view [46]

"Doing the actual preparations for the medications would be good, I think." [P3]

"So, I think an element that can be added to the MyDispense to make it more advanced is if we, the users, can count the pill that will be dispensed." [P6]

"I think good graphics is very... good graphics will be a big help in MyDispense. Also, the option that you can manipulate there as a pharmacist." [P8]

Self-paced Learning

MyDispense, a virtual learning platform, has allowed students to maintain a sense of connectedness with the practice of pharmaceutical dispensing in the comfort of their homes, which has become beneficial for its accessibility in the age where distance learning has become part of the new normal [54]. According to a previous study, educational scientists classified e-learning into different categories, emerging two prominent types of virtual learning: computer-based e-learning and internet-based e-learning [55]. MyDispense belongs under the internet-based e-learning, successful utilization of technological advancements in pharmaceutical learning [56]. That said, dispensing students provided feedback on their struggles with internet-based e-learning and how it could be improved.

"So, for the improvements, I think it would be best if they could give it as a practice for students without an internet connection like they will put its availability Offline." [P1]

In connection to this, there is a necessity for efficient learning opportunities in using the application. An offline version of MyDispense would aid students with difficulties such as a stable internet connection, which is a common issue [52]. Furthermore, the offline version will lessen the technical obstructions to e-learning and promote higher participation for those new to utilizing virtual simulations such as MyDispense [44].

3.3 Point of Data Integration

Table 3.7 - *Joint Display Table for Quantitative and Qualitative Results*

Domain	Qualitative (Significant codes)	Quantitative (Mean value)
Prescription Handling	MyDispense offers conducive features for users MyDispense aids users in making decisions about patient care Drug classifications and familiarization skills Activates students' cognition and critical thinking skills Improves timely manner dispensing	4.31 (High Level of Confidence)
Patient Counseling	Enhances communication skills Drug classifications and familiarization skills MyDispense provides patient-counseling practice	4.31 (High Level of Confidence)

Prescription Handling

The first domain is prescription handling, and data shows corroboration on quantitative and qualitative approaches. The mean average is 4.31, which is described as high; it is shown in Table 3.15. This finding is supported by the following codes extracted from the significant statements found in the thematic analysis of the participants below. This domain is fit for data integration and is considered a confirmation. Confirmations happen when the quantitative and qualitative results conform to each other. As two data sources 84 provide similar conclusions, the results have greater credibility. Therefore, the participants' experiences in this particular domain show confirmation in quantitative and qualitative approaches. The responses below are the following significant responses that surfaced during the in-depth interviews.

"There is a lot of learning that I have learned from there - from obtaining the prescription, from reading the prescription, from identifying the parts of the prescription." The first statement in the questionnaire got a mean score of 4.34, which reveals a high skill in checking the completeness and authenticity of prescriptions. *"It helps students communicate with patients."* The second statement has a mean score of 4.40, which is high, revealing that the students are highly skilled in gathering personal and medical information from the patient. *"They get to have this knowledge about asking the patients, knowing the prescriptions, knowing the interactions, as well as knowing if they have given the proper medication and the proper dosage with ancillary labels."* The third statement got a mean score of 4.53, indicating very high skill in checking and verifying the patient's identity before dispensing the medication.

Moreover, the clinical check of prescribed medicines to the patients before dispensing is vital to prevent harming the patient. *"It helps us in properly learning the process, the correct process of dispensing"* and *"We get to practice the whole process of dispensing and our speed also in dispensing*

medications efficiently". The fourth statement got a mean score of 4.28, which shows that the respondents have a high skill in dispensing prescribed medications following standards, guidelines, and policies. *"MyDispense has helped me improve my skills in dispensing medication for patients"* of P8. The fifth statement got a mean score of 4.43, revealing a high skill in dispensing medications safely and rationally. *"The main strength is by having a cashier where you pay. Also, labeling and packaging,"* stated P4. The sixth statement got a mean score of 4.19, indicating that the respondents are skilled in selecting appropriate containers for the medications. *"They get to have this knowledge about asking the patients, knowing the prescriptions, knowing the interactions, as well as knowing if they have given the proper medication and the proper dosage with ancillary labels."* The seventh statement earned a mean score of 4.19 showing high skill in providing accurate ancillary labels needed for the medication. *"They get to have this knowledge about asking the patients, knowing the prescriptions, knowing the interactions, as well as knowing if they have given the proper medication and the proper dosage with ancillary labels."* as stated by P1.The eighth statement got a mean score of 4.28, which shows a high level of skill in providing essential details about the medication. *"All data were already available there"* by P8.The ninth statement got a mean score of 4.40, which reveals a high skill in checking prescription drugs through the patient's personal information and medical records. *"Patient responds quickly. I think the quick responses from the patient is a strength,"* as said by P8. The tenth statement got a mean score of 4.11, showing a high skill level in promptly accomplishing the dispensing process.

Patient Counseling

The second domain is for patient counseling. The same pattern was observed; data show corroboration on both quantitative and qualitative approaches. This domain is fit for data integration and is considered a confirmation. Confirmations happen when the quantitative and qualitative results conform to each other. As two data sources provide similar conclusions, the results have greater credibility. Therefore, the participants' experiences in this particular domain show confirmation in both quantitative and qualitative approaches. The responses below are the following significant responses that surfaced during the in-depth interviews. A significant response from P4 said *"We've learned on the familiarization of the drugs that they use."* The first statement in the questionnaire got a mean score of 4.29, showing a high skill level in counseling the patients on their medication-related problems. A response from P7 said that it , *"Enables to learn a lot on the skills of patient counseling."* The second statement scored 4.27, revealing a high skill level in providing current, objective, and evidence-based information. P7 states that, *"[MyDispense] It was helpful because it supplements additional information and enhances skills in patient counseling."* The third statement got a mean score of 4.17, which shows high skill in utilizing communication methods to ensure that counseling is effective. Revealing a high skill in informing patients of dosing regimens, precautions, potential adverse effects, storage requirements, and proper disposal .The fourth statement got a mean score of 4.39. The fifth which reveals a high skill in patient education on disease prevention and awareness. The said statement has a mean score of 4.27. The results from statements three and four can be confirmed by these responses *"It help sharpen one's skills in counseling the patients"* and *"It gives you a theoretical view of a wide range of different patients"* by P2 and P5, respectively. The sixth statement got a mean score of 4.31, showing a high skill level in responding and providing accurate and relevant answers to patients' questions. This is confirmed by the response of P3, *"You know, giving out all the information that the patient would need."* The seventh statement reveals a high skill in informing the patients of the appropriate use of medications and the side effects of poor medication adherence. It got a mean score of 4.39. The seventh and eighth statements are confirmed by P7 saying, *"As I have mentioned, added skill in the area of patient education on to handle them with regards to their medications."* The eighth statement got a mean score of 4.44, which shows high skill in advising the patient not to skip a dose of antimicrobial medication and finish the therapy. As said by P5 that *"For patient counseling, you were given references, so it gives you the analytical thinking of summarizing your references and turning it into layman's term for your virtual patient to understand."* The ninth statement got a mean score of 4.40, showing a high level of skill in counseling the patient most simply and ensuring they have understood the points. P6 stated, *"I think we can learn proper patient counseling from MyDispense."* The tenth statement got a mean score of 4.32, revealing a high level of skill in addressing the concerns and complaints raised by the patient about the side effects of medications. However, there was no specific response to counseling that concerns the complaints of a patient's side effects from medications.

Discussions

Based on the joint display table from the quantitative and qualitative data, MyDispense has greatly helped the students in reaching a high level of confidence in their pharmaceutical care skills as the virtual simulation provides life-like environments for them to practice dispensing processes in a clinical setting [6]. Despite the lack of face-to-face instruction and learning experience during the pandemic, the survey garnered an average mean of 4.31 for both prescription handling and patient counseling.

This translates to a high confidence level when practicing these skills using MyDispense because the cases provided in the virtual simulation heighten knowledge, judgment, and behavioral and functional skills necessary for medication use management systems and providing patient-centered care [43]. Experiential learning was found to be a significant advantage and benefit of using MyDispense in the curriculum which led to a high level of confidence in their pharmaceutical care skills. The mean level of confidence and socio-demographic profile of the students showed no significant relationship with each other as their characteristics such as year level, location, and device or gadget were factors not mentioned during the interviews. Instead, delays and system glitches [36], and technical issues [37] were challenges experienced by the students; hence an up-to-date system is required for efficient utilization. The language barrier is another factor that affects the practice of counseling as training students through MyDispense should improve communication skills [41] and enhance their communication styles [30]. Due to this, the students recommended a customizable dispensing system in the aspect of practice contextualization and the development of valuable features such as the addition of experiential cases and a self-pace interface for a more advanced user experience. This connects to a previous study [28] suggesting that virtual simulations must be made interactive for students to build a pharmacist-patient relationship.

4. Conclusion

MyDispense is a virtual simulation where students can deliver pharmaceutical care skills while practicing drug dispensing in an online and safe environment. It aids in building their skills in prescription handling and patient counseling, which are critically required in community and hospital pharmacy; hence MyDispense provides a platform for the students to explore, use analytical and critical thinking, and recall concepts from their pharmaceutical subjects. This study demonstrated that the socio-demographic profile of the students does not significantly affect their confidence in pharmaceutical care skills. The self-directed survey based on the Philippine Pharmacy Practice manual showed a trend where students scored a high level of confidence in prescription handling and patient counseling skills through experiential learning in MyDispense cases. Challenges experienced by the students included technical and language barriers, suggesting a customizable dispensing system for an advanced user interface. The study shows that MyDispense has brought meaningful and valuable pharmaceutical dispensing education that allows students to correct prescriptions, fill prescriptions, and practice time-sufficient counseling to patients. As the new normal has slowly become integrated after the pandemic, there is a need to create practical and efficient learning opportunities for students. Finally, find breakthroughs that address the lack of modern equipment and formulate robust software for quality pharmaceutical education.

Acknowledgements

The authors gratefully acknowledged all participants, the deans of the institutions, contributors, validators, statisticians, and San Pedro College for making this study possible.

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