Effectiveness of Drug Information Instructional Materials for the Deaf: Towards an Enhanced BS Pharmacy Curriculum

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Abstract: Acknowledging that language barriers between the pharmacist as the health care provider and the deaf as the patient have been the most prominent limiting factor in providing accessible and quality pharmaceutical care services to the deaf, this study made use of a set of drug information instructional materials in integrating a lesson about providing patient counselling to the deaf in the course Dispensing and Medication Counselling I in the new BS Pharmacy Curriculum. The study assessed the effectiveness of the use of the said materials through a survey and through the scores obtained by BS Pharmacy student-respondents from a paired pre- and post-test, and a summative test. Findings showed that the instructional materials consist of a video and a reference guidebook were perceived by Pharmacy students as highly effective in serving its purpose. The materials were also found highly effective in improving the students' awareness on deaf culture and communication and effective in developing their basic sign language skills used in communicating drug information. The study recommended the integration of the materials across different health education and continuing professional programs to help catalyze positive change by providing more inclusive health services to the Deaf.

Keywords: Curriculum, Deaf, Higher Education, Instructional Materials, Pharmacy

1. Introduction

Members of the deaf community are one of the most underserved sectors of the society. In the healthcare sector particularly, deaf patients struggle to communicate with health practitioners due to the former's lack of knowledge of basic medical knowledge and of the latter's lack of knowledge on deaf awareness and basic sign language. Glaring evidence of this unfortunate instance is when deaf patients pay for interpreters on top of medical expenses. This struggle was also illustrated in the short film entitled After Haiyan, Director Michael Nedelman exposed the struggle of the surviving deaf community in Tacloban City, Philippines in accessing basic services, disaster relief and medical care (Nedelman, 2014).

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In the 2005 National Survey on Hearing Loss and Hearing Impairment conducted by Better Hearing Philippines, it was estimated that the hearing disability prevalence in the country is at 8.8% (Martinez et al., 2005). This means that about one for every 11 Filipinos has a hearing disability.

While these facts present the challenges that a Filipino deaf will face when interacting with someone who is hearing, it is also notable that not only in terms of employability, and education that the Filipino deaf will have to face these challenges, but also on receiving basic social services such as health services, particularly access, understanding and compliance to drug information and education.

Drug information education is a product of patient counselling, a professional task provided by a duly registered Pharmacist (Republic Act 10918, 2016). The Pharmacist claims expertise in drug and medication information that is useful when deciding, recommending, monitoring, and providing drug therapy to patients for both common and complicated ailments. In patient counselling, the Pharmacist usually assures patient understanding and compliance of and to the drug regimen, the drug and the disease or condition. In the Philippines, patient counselling is usually done in verbal and written communication using Filipino or English languages.

Conducting patient counselling to the deaf can be quite a challenge since the Filipino deaf is a native Filipino Sign Language speaker, a language different from both written and spoken mother tongues in terms of morphology, phonology, and syntax. To emphasize, the Filipino deaf's comprehension to written mother tongue languages is also low which can be the bridge language when a Filipino deaf communicates with a hearing. Thus, in patient counselling, the understanding and compliance of a deaf patient to his drug, drug regimen and condition remains in question.

With this, a study by Lamadrid-Catublas published a Filipino Sign Language guidebook and video for pharmacists and health care providers that can help ease the language barrier and promote understanding between the hearing provider and the deaf patient (Lamadrid-Catublas, 2018).

This study tried to propose the integration of the above-mentioned developed drug information instructional materials for the deaf to the Bachelor of Science in Pharmacy (BS Pharmacy) curriculum of a private higher education institution by measuring its effectiveness through a survey and through the scores obtained by BS Pharmacy student-respondents from a paired pre- and post-test, and a summative test.

There is a gap in the provision of patient counselling services to the Deaf community due to language barriers between them as the patients and with the pharmacists as their health care provider. Pharmacists are not trained to provide patient counselling to the Deaf as there is not a prescribed module in their institutional training on how to communicate with them. In the current pilot implementation of the revised Commission on Higher Education (CHED) prescribed Policies, Standards, and Guidelines for the Bachelor of Science in Pharmacy Program (CHED Memorandum Order no. 54, 2018), there is a need to integrate a module on drug information counselling and communication to the deaf using drug information instructional materials in the Dispensing and Medication Counselling course in the current BS Pharmacy curriculum to help address the gap.

Specifically, the study (i) determined the perceived effectiveness of the drug information instructional materials for the deaf to the student-respondents in terms of: a. instructional objectives; b. content; c. teaching methodology/ delivery; d. methods of assessment; and e. perceived learning outcomes; (ii) analysed the effectiveness of the drug information instructional materials by describing the scores obtained by the student-respondents in their Basic Deaf Communication and Drug Information Communication Assessment; and (iii) assessed whether the instructional materials were effective in improving the student-respondents' awareness about the deaf and their culture as reflected on the change in the pre and post-test scores in their Deaf Awareness and Culture Assessment.

2. Materials and Methods

2.1 Research Design

The study used a combination of descriptive and pre-experimental design in research to describe the effectiveness of the drug information instructional materials for the deaf to the student-respondents. Through the descriptive design, the researcher determined the perceived effectiveness of the drug information instructional materials for the deaf using a survey questionnaire. A summative assessment test on the basics of deaf communication and drug information communication was also administered that described the learning of the students after the cascade of the instructional materials. After which, the test scores were described and discussed. Through a pre-experimental design called one-group pre-test post-test design, the researcher also determined the effectiveness of the drug information instructional materials for the deaf by means of an administered paired pre- and post-test on Deaf Awareness and Culture. Change in scores from pre- and post-tests were computed and used to determine whether there was an improvement in the knowledge of the student-respondents about Deaf Awareness and Culture after instruction using the drug information instructional materials for the deaf.

2.2 Research Participants

The respondents were purposively chosen based on the qualified samples within the school's population. There were 30 Bachelor of Science in Pharmacy students who were enrolled in the Dispensing and Medication Counselling I course in the entire institution during the time of the conduct of the study. These students were all asked and had given their consent to be part of the study, hence, a complete enumeration of the qualified samples within the population was made.

2.3 Instrumentation

The instructional materials were developed by and adapted from the study of Lamadrid-Catublas in 2018, the paired pre- and post-tests were adapted and modified from the self-check assessment from the author's guidebook that served as a data collection tool. All materials that were used from Lamadrid-Catublas' study were granted permission.

The summative assessment test was self-developed by the researcher. The test items were picked from those discussed using the instructional materials. The format and methods of assessment were the same as those used in the Filipino Sign Language (FSL) Learning Program of the School of Applied Deaf Studies of the De La Salle-College of Saint Benilde.

In the post-administration validation of the summative test, it was seen that of the 20 questions in the test, eight of them were of average difficulty, while the remaining 12 were described as easy. Out of the test's 20 questions, six of them were very good items in discriminating learning, while another six were reasonably good items. While four items are marginally good items needing revision, and another four were poor items that were recommended for rejection. At the end of the activity, a survey questionnaire was answered by the students that measures their perception on the effectiveness of the drug information instructional materials on the following aspects:

- Instructional Objectives, with four questions;
- Content, with six questions;
- Teaching Methodology/Delivery, with six questions;
- Methods of Assessment, with four questions; and
- Perceived Learning Outcomes, with five questions.

The survey questions used a five-point Likert scale to assess the students' perceived effectiveness of the instructional materials. The survey questionnaire was composed of 25 positively framed statements that the respondents would have to tick a number that corresponds to their level of agreement to each statement. Number 5 represents that the respondent strongly agrees, 4 if the respondent agrees, 3 if the respondent somehow agrees, 2 if the respondent disagrees, and 1 if the respondent strongly disagrees with the statement.

The survey questionnaire was adapted from a questionnaire published in 2003 by the National Research Council edited by Fox and Hackerman in the paper titled Evaluating and improving undergraduate teaching in science, technology, engineering, and mathematics (National Research Council, 2003). The survey questionnaire was adopted from the Student Instructional Report II evaluation form from the said paper where it was already tested for validity and reliability and recommended for public use (National Research Council, 2003). Only questions regarding evaluation of instructional materials were lifted. These were then modified to fit into the narrative by which the study operates, namely in the aspects of instructional objectives, content, teaching methodology/delivery, methods of assessment, and perceived learning outcomes. The questions were then face validated by a subject specialist.

Like the survey questionnaire, the paired pre- and post-tests were also adapted and modified from the study of Lamadrid-Catublas, it was then face and construct validated by an expert in the field. To add, both the survey questionnaire and the paired pre- and post-test were piloted to a previous batch of BS Pharmacy students from the same institution who took the same course in the previous school year.

In the post-administration validation of the post-test, it was observed that all the 20 questions in the post-test were described as having average difficulty. Out of the test's twenty questions, nineteen of them were very good items in discriminating learning, while the remaining one was a reasonably good items that is recommended for improvement.

2.4 Data Collection Procedures

The study was done virtually as classes for the semester were fully conducted through online distance learning platforms due to the restrictions brought about by the COVID-19 pandemic in the country.

ZOOM™ Meetings application was used as a platform in the synchronous instruction of the lesson using the drug information instructional materials. The instructional materials were shared to the students by accessing the TulaySenyas website provided by the researcher (Lamadrid-Catublas, 2020), where they can view and download the instructional video and the reference guidebook. ZipGrade™ and Google™ Forms apps were used as platforms for administering assessments and the survey questionnaire.

2.5 Data Analysis

Descriptive statistics was used to quantify the perceived effectiveness of the student-respondents on the drug information instructional materials for the deaf using the five-point Likert scale. Descriptive statistical methods were also used to describe the performance of the students in the receptive and expressive skills tests that form the summative assessment of the student-respondents' learning on Deaf communication and drug information communication after the cascade of the learning instructional materials.

The percentage rate of change on the mean test scores obtained from pre and post-tests on the deaf awareness and deaf communication were obtained and compared to describe actual learning outcomes. The scores of the student-participants on the paired pre- and post-tests about Deaf awareness and culture were analysed with the use of descriptive statistics. This was then used to describe whether the learning activity using the drug information instructional materials were able to help improve the student-participants' scores in the assessments.

3. Results and Discussions

There were 30 student-respondents in the study. Twenty-two of them were females, and eight of them were males. Of the total number of the student-respondents, 10 of them were 19 years old, 11 of them were 20 years old, eight of them were 21 years old, and one of them was older than 21 years old.

3.1 Students' Perceived Effectiveness of the Instructional Materials

Generally, the student-respondents strongly agreed that the instructional materials were able to help them apply various strategies in communicating drug-related information (Table 1). The student-respondents strongly agreed that the instructional materials were able to help them develop knowledge and understanding of the deaf world/culture, of the different communication barriers hindering effective delivery of medication-related instructions to deaf and hard-of-hearing patients, and of the different myths and misconceptions about the deaf.

All these imply that the drug information instructional materials were highly effective in all the mentioned parameters in achieving the lesson's instructional objectives.

Table 1: Students' perceived the effectiveness of instructional objectives

Instructional Objectives	(5) Strongly Agree	(4) Agree	(3) Somehow Agree	Mean	Interpretation
The instructional materials that were presented and discussed helped me apply various strategies in communicating drug-related information.	33%	63%	3%	4.27	Highly Effective
The instructional materials that were presented and discussed helped me develop my knowledge and understanding of the deaf world/culture.	57%	40%	3%	4.50	Highly Effective
The instructional materials that were presented and discussed helped me develop my knowledge and understanding of the different communication barriers hindering effective delivery of medication-related instructions to deaf and hard-of-hearing patients.	50%	43%	7%	4.39	Highly Effective
The instructional materials that were presented and discussed helped me develop my knowledge and understanding of the different myths and misconceptions about the deaf.	50%	43%	7%	4.39	Highly Effective

According to Robey et al. (2013, cultural competence provides one conceptual framework through which disability-related content and experiences can be understood and presented in health care education (Robey et al., 2013). One of the objectives of this study is to make the students become aware and competent of the deaf culture by learning about the nature of deafness and the teaching-learning context for deaf learners.

In a study by Chaveiro et al. (2009), it was noted that medical practitioners need to understand and be aware of the situation of their deaf patients for them to adjust their services as it fits to their needs, and to be able to successfully overcome barriers to communication. This was also raised in the short documentary, After Haiyan (Nedelman, 2014) where the medical personnel were explaining the importance of cultural competence in serving the needs of the deaf population in an emergency, and that a one-size-fits-all approach in providing service would not be feasible. The respondents of this study have strongly expressed their agreement to these propositions.

The student-respondents strongly agreed that the video presentation was worth viewing, and that they can easily relate and comprehend the topics that were presented in the instructional material (Table 2). This implies that the contents of the video were highly effective, and the reliability of the instructional materials were found by the students to also be highly effective for them.

While the student-respondents strongly agreed that the contents of the instructional materials on drug information were aligned to those that were taught to them in school, they only agreed that the contents of the instructional materials were easy to understand as a hearing student.

Table 2: Students' perceived the effectiveness of content

Content	(5) Strongly Agree	(4) Agree	(3) Somehow Agree	Mean	Interpretation
The contents of the instructional materials were easy to understand as a hearing student.	40%	43%	17%	4.17	Effective
The texts in the guidebook were worth reading.	27%	57%	17%	4.05	Effective
The video presentation was worth viewing.	63%	33%	3%	4.56	Highly Effective
The contents of the instructional materials regarding drug-related information were aligned to those that were taught to me in school.	50%	37%	13%	4.30	Highly Effective
The instructional materials appealed me to independently study and review the topics at home.	33%	50%	17%	4.11	Effective
The topics in the instructional material were presented in a manner that I can easily relate and comprehend.	50%	43%	7%	4.39	Highly Effective

Unlike a strong perception of agreement towards the video, the student-respondents only agreed that the contents of the reference guidebook were worth reading. Most of the student-respondents agreed that the instructional materials appealed them to independently study and review the topics at home. Among the statements on the second part of the questionnaire, the student-respondents agreed the most to the statement that the video presentation was worth viewing.

In an integrative review of 19 studies regarding technologies for health education to the deaf made by Galindo Neto and colleagues in 2018, it was noted that the predominant type of technology was video which was present in 10 studies. In 17 of these studies, the technologies were even applied with the deaf,

and 16 of which were proven effective and viable for health education. Most studies revolved around the topics of cancer and oral health (Galindo Neto et al., 2018).

In general, most of the student-respondents strongly agreed that when it comes to the teaching methodology and delivery of the topics using the instructional materials, the instructor was highly effective and was able to make clear and understandable presentations, and to make use of examples to clarify the course material (Table 3). They also strongly agreed that the instructor was enthusiastic on the use of the instructional materials, helpful and responsive to the concerns of the students regarding the material, concerned on the students' progress, and was willing to listen and answer to the students' questions and opinions with which high effectiveness can also be implied.

Table 3: Students' perceived the effectiveness of teaching methodology/delivery

Teaching Methodology/ Delivery	(5) Strongly Agree	(4) Agree	(3) Somehow Agree	Mean	Interpretation
The instructor was able to make clear and understandable presentations.	40%	53%	7%	4.29	Highly Effective
The instructor made use of examples to clarify the course material.	53%	47%	0%	4.51	Highly Effective
The instructor was enthusiastic on the use of the instructional materials.	40%	60%	0%	4.37	Highly Effective
The instructor was helpful and responsive to my concerns.	40%	53%	7%	4.29	Highly Effective
The instructor was concerned for my progress.	33%	63%	3%	4.27	Highly Effective
The instructor was willing to listen and answer my questions and opinions.	47%	50%	3%	4.40	Highly Effective

During the course of the study and the post-activity discussion, some directly observed behaviour of students were that they were appreciative of the instructor's responsiveness to their concerns and enthusiasm in the lesson while using the materials. Student A said that: "I appreciate that even though some of the materials can be self-explanatory in nature, the instructor was still open in attending to our concerns and is even happy when he sees us also interested into learning sign language of the commonly used phrases in patient counselling"

As shown in Table 4, generally, the student-respondents strongly agreed that when they were being assessed of their learning from the topic with the use of the instructional materials, the information that was given to them on how they were being graded were clear, the test questions were clear and that it covered the important aspects of the lesson, and that the instructor was able to give his comments and

feedback on the results of the tests. From this, it can be implied that the students find the instructional materials as highly effective in terms of methods of assessment.

Table 4: Students' perceived the effectiveness of methods of assessment

Methods of Assessment	(5) Strongly Agree	(4) Agree	(3) Somehow Agree	Mean	Interpretation
The information given to us about how we would be graded/assessed were clear.	33%	63%	3%	4.27	Highly Effective
The test questions were clear.	50%	50%	0%	4.47	Highly Effective
The tests covered the important aspects of the lesson.	43%	57%	0%	4.41	Highly Effective
The instructor commented on the results of the tests.	33%	63%	3%	4.27	Highly Effective

During the course of the assessment, some directly observed behaviours of students were that they were appreciative of the immediate feedback of the methodology towards their answers. Student B said that: "It's good that the teacher outright identified whether we answered an item correctly or not. We also got the correct answer in case we got an item wrongly. The instructor was also not judgmental of our wrong answers and always encourages us to practice more even after the lesson."

The student-respondents generally had a strong agreement that the lesson and activities conducted with the use of the instructional materials were highly effective in helping them to think independently about the subject matter, and to get actively involved in what they were learning about the subject (Table 5). They also strongly agreed that through the lesson, their learning in the subject has increased, and that they made progress towards achieving the course objectives of the subject Dispensing and Medication Counselling I. Meanwhile, the student-respondents agreed that the lesson was effective in helping them increase their interest in the subject area.

Table 5: Students' perceived the effectiveness of learning outcomes

Perceived Learning Outcomes	(5) Strongly Agree	(4) Agree	(3) Somehow Agree	Mean	Interpretation
My learning in the subject was increased by this lesson.	43%	50%	7%	4.32	Highly Effective
Through this lesson, I made progress toward achieving the course objectives (CILO) for the subject (DMC-I).	47%	47%	7%	4.35	Highly Effective
My interest in the subject area increased through this lesson.	33%	57%	10%	4.19	Effective
This lesson helped me to think independently about the subject matter.	37%	57%	7%	4.26	Highly Effective
This lesson actively involved me in what I was learning about the subject.	37%	63%	0%	4.34	Highly Effective

During the course of the post-activity discussion, many students were more interested and asked questions from the instructor on anecdotes of interacting with a deaf patient. Student C said that: "I always thought that the deaf would always be dependent on an interpreter when transacting and availing public services such as lawyers, doctors, or pharmacists. I learned that as a pharmacist, there are many things that we can do to reach out to them better. By knowing how they comprehend things and a little sign language, a health care provider can already make a thing such as patient counselling more convenient for deaf patients to avail."

Generally, the student-respondents strongly agreed that they find the instructional materials highly effective in terms of helping them attain the subject's instructional objectives, of its content, of the teaching and assessment methodologies used together with the material, and of their perceived improvement in learning after the use of the materials (Table 6).

Table 6: Students' perceived the effectiveness of the instructional materials

	(5) Strongly Agree	(4) Agree	(3) Somehow Agree	Mean	Interpretation
The instructional materials were effective in terms of attaining the activities' instructional objectives.	48%	48%	5%	4.38	Highly Effective
The instructional materials were effective in terms of its content.	44%	44%	12%	4.26	Highly Effective
The instructional materials were effective in terms of teaching methodologies used.	42%	54%	3%	4.35	Highly Effective
The instructional materials were effective in terms of the methods of assessment used.	40%	58%	2%	4.35	Highly Effective
The instructional materials were effective in terms of the students' perception of their learning.	39%	55%	6%	4.29	Highly Effective

The dissertation of Lamadrid-Catublas in 2018 has put the instructional materials into review by three validators and all of which have rated the materials "excellent" in all the criteria included in the validation tool (Lamadrid-Catublas, 2018). The same materials were used in a classroom setting for an actual lesson and was rated by the students through a perceived effectiveness survey. The results revealed that the students strongly agreed that the materials were effective in all the aspects that were included in the survey tool.

3.2 Analysis of the Results of the Summative Assessment of the Students Basic Deaf Communication and Drug Information Communication Skills

The average score of the 30 students who took the Summative Test on the Basics of Deaf Communication and Drug Information Communication was 85% (Table 7). Dissecting the test into parts, the average score in receptive skills scores was 87% while in expressive skills scores was 82%. The highest scorers in all the tests had a score of 100%, while the lowest scorer in receptive skills test got a score of 20%, in expressive skills a score of 50%, and in total scores 45%.

Table 7: Summary of scores obtained by students in the summative test

	Receptive Skills (n= 30)	Expressive Skills (n= 30)	Combined (n= 30)
Average Score	87%	82%	85%
Lowest Score	20%	50%	45%
Highest Score	100%	100%	100%

The following figure shows the bar chart of the scores obtained by all students who took the summative test. It shows that most students got a score from the upper tenth bracket in all tests. Twenty-one out of 30

students got a score of above 90% in the receptive skills part, 13 students got the same score in the expressive skills part, and a majority of 17 out of 30 got the same scores in both parts combined.

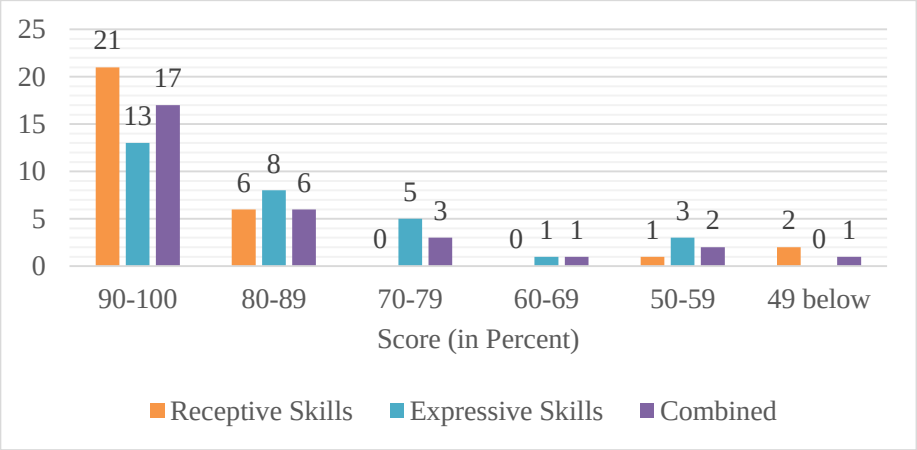

Figure 1: Scores obtained by students in the summative test

Table 8 shows the scores versus the test's table of specifications. The test was able to gauge the students' progress in the two lowest levels of learning in the psychomotor domain, particularly Imitation and Manipulation. Out of the 20 questions, 10 of which assessed imitating skills of the students, all questions from the receptive part of the test. The remaining 10 questions assessed manipulating skills of the students, with all questions coming from the expressive part of the test.

Out of the 20 questions in the test, 12 were regarding basic deaf communication, with four questions regarding Wh-questions, another four regarding greetings and common conversation, and colour signs and different people with two questions each. Eight out of the twenty questions were regarding Drug Information Communication, these were further divided into four questions each about side effects and telling time and frequency of drug administration. Overall, the students were able to demonstrate imitating skills 87% of the time and manipulating skills 82% of the time.

Table 8: Analysis of summative test scores as to content area and thinking skill

Psychomotor Skills Objectives						
Content Area	Imitation		Manipulation		Total	
I. Basic Deaf Communication	Items	% Correct	Items	% Correct	No of Items	% Correct
Wh- Questions	3,4	88%	13,14	90%	4	89%
Color Signs	5	93%	15	97%	2	95%
Greetings and Common Conversation	6,7	95%	16,17	85%	4	90%
Different People	1	77%	11	83%	2	80%
II. Drug Information Communication						
Time and Frequency of Drug Administration	2,6	88%	12,16	80%	4	84%
Side Effects	9,10	85%	19,20	67%	4	76%
Grand Total		87%		82%	20	85%

3.3 Analysis of the Results of the Pre-Test and Post-Test on Deaf Awareness and Culture

The average score of the 30 students in the Pre-Test was 40% (Table 9). The average has doubled with a 100.8% increase to a score of 79% in the post-test taken after the learning activities were conducted using the instructional materials. Evident in the percentage rate of change in pre- and post-test scores, the learning session supplemented with the drug information instructional materials for the deaf has been effective in increasing the learning of the student-respondents in deaf awareness and culture.

The scores of both the top and lowest scorers have also improved in the post-test by 166.7% and 46.1%, respectively. The top scorer in the post-test got a score of 95% as compared to that of the pre-test with only 65%. Same goes with the lowest scorers, of whom from the post-test got a score of 40%, while from the pre-test got a score of only 15%.

Also, it is notable that even though there was a slight increase in the standard deviation of scores in the post-test (15.2) than that from the pre-test (11.5), by looking at the drastic increase in both the median and mode scores in the post-test from the pre-test, it was evident that the administration of the lessons with the use of the instructional materials has drastically skewed the symmetric bell-curve distribution of scores in the pre-test into a negatively-skewed bell-curve distribution of scores in the post-test. This means that the administration of the instructional materials helped improve the performance of the students in their tests.

The bar chart of the scores obtained by all students in the pre- and post-test also shows an inversion in the trend of student scores from both tests. A downward trend from higher to lower scores were seen from post-test results as opposed to the upward trend from higher to lower scores were seen from pre-test scores where majority of the students obtained a mark of below 50%.

Table 9: Summary of scores obtained by students in the pre- and post-test

	Pre-Test in Deaf Awareness and Communication (n=30)	Post-Test in Deaf Awareness and Communication (n= 30)	Percentage Rate of Change
Average Score	39.5%	79.3%	100.8%
Median Score	40%	85%	112.50%
Mode	50%	95%	90%
Std Deviation	11.5	15.2	
Lowest Score	15%	40%	166.67%
Highest Score	65%	95%	46.15%

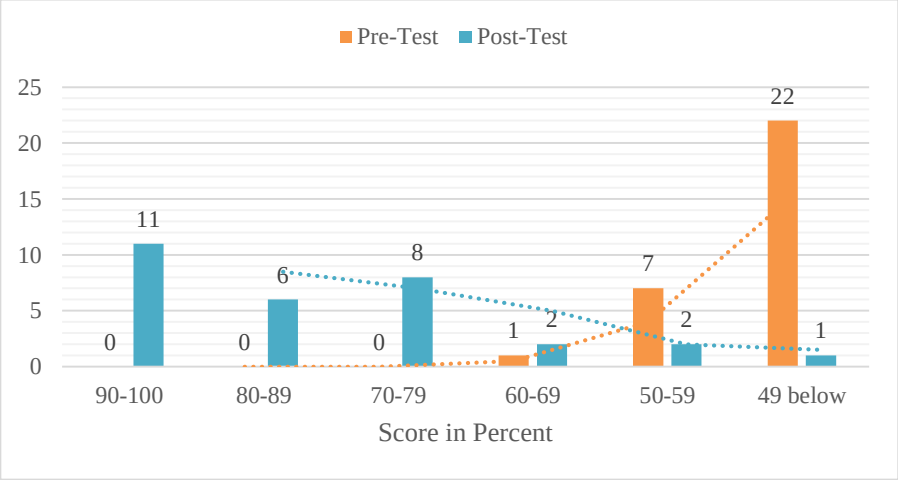

Figure 2: Scores obtained by students in the pre- and post-test

Table 10 shows the test scores versus the test's table of specifications. The test was able to gauge the students' progress in the two lowest levels of learning in the cognitive domain, particularly Remembering and Understanding. Out of the 20 questions, nine of which assessed the remembering skills of the students. The remaining 11 questions assessed the understanding skills of the students.

Out of the 20 questions in the test, two were about Filipino Deaf Culture, three were about the nature of deafness and speech, and topics about the Etiology of Hearing Loss, Myths and Misconceptions about the Deaf, and Patient Counselling Services to the Deaf have been allocated with five questions each.

Overall, the students were able to demonstrate remembering skills 76% of the time and understanding skills 82% of the time.

Table 10: Analysis of post-test scores as to content area and thinking skill

Cognitive Skills Objectives						
Content Area	Remembering		Understanding		Total	
Deaf Awareness and Culture	Items	% Correct	Items	% Correct	No of Items	% Correct
Filipino Deaf Culture	1	100%	2	70%	2	85%
Nature of Deafness and Speech	-	-	3,9,10	80%	3	80%
Etiology of Hearing Loss	4,5,6,7,8	67%	-	-	5	67%
Myths and Misconceptions about the Deaf	12,13,15	82%	11,16	80%	5	81%
Patient Counselling Services to the Deaf	-	-	14,17 18,19,20	87%	5	87%
Total	9	76%	11	82%	20	79%

4. Conclusions

In the realization that there are still many health care providers incapable of effectively providing health services to the deaf, this study hoped to contribute to the training of future pharmacists with the right set of knowledge, skills, and attitude to help make provision of drug information services to the deaf more effective and accessible. In this study, it was found out that:

1. The drug information instructional materials were perceived by the students as highly effective in helping them communicate drug information to the deaf. This will help increase their confidence when communicating and conducting patient counselling to the deaf.
2. The drug information instructional materials helped the students develop their receptive and expressive skills in communicating using Filipino Sign Language that will help them make their patient counselling to the deaf more effective, and
3. The drug information instructional materials were effective in helping the students become more aware of the deaf culture and improved their cultural competence that will help them make their patient counselling to the deaf more accessible.

Further, it can be concluded that the inclusion of drug information education to the deaf with the use of the instructional materials into the Dispensing and Medication Counselling I course has made a positive impact on the course's intended outcomes as it produced students who are more holistic and who are more inclusive to the needs of their patients.

However, the inclusion may seem to be an extra taxing workload to an already crimped course plan of the BS Pharmacy curriculum, this may also give the future professionals little to no gain in terms of attaining continuing education units required of them by the law, among other rewards may also allow them to see this again as an extra workload. Despite these, learning about the lessons and applying them into practice would contribute to the resolution of a global public health issue by helping reduce health inequalities to

the underrepresented people, such as the deaf, and by contributing to unmet global health targets due to the marginalized sector's inaccessibility to effective patient care.

It was also noted that it can be an overstatement to say that the integration of the instructional materials has already addressed the health disparities in the services available to the deaf, but it can be noted that the integration is already a leap forward towards promoting a culture of inclusion and empathy for all in the health care service sector. Cultural competence among several health care providers disrupts the status quo of myths and misconceptions about the deaf by uneducated health care providers, this will help fuel and may lead to the realization of a myriad of projects, big or small, by health care providers in improving and in providing more accessible and effective health services to this underrepresented sector.

It can also be concluded that if deaf education with the use of an instructional material of the likes with the one used in this study across several educational programs, this will be a catalyst for positive change to the future of our society. Aside from attaining the visions of the laws and declarations presented in this study, this will also help build a more inclusive society wherein the deaf would not feel alienated from the hearing world anymore.

Based on the results of this study, the following recommendations are offered:

1. The drug information instruction materials must be improved further by regular revisions that will help update the material and contextualize it as to the emerging and re-emerging health concerns of the people, the current pandemic for example. Also, it must be improved by incorporating standardized and validated tests that will gauge learning of its end-users. This will help the material to be an all-in-one tool in the provision of the module on deaf communication in the BS Pharmacy curriculum.
2. The drug information instructional materials may be adapted and revised for virtual, flexible, blended, and face-to-face modalities of teaching and learning. In the advent of varying modes of learning, making the material adapt to whichever platform an institution prefers to use in its instruction would help in making more future pharmacists properly equipped with the right set of knowledge and skills in providing pharmaceutical care services to the deaf, that would also improve the Deaf's accessibility to these services in the future.
3. Pharmacy institutions should realize the importance of being able to acquire the set of knowledge and skills in communicating with the deaf and continue to incorporate such in the training of a pharmacist as a health care provider. The use of these supplements, or the development of similar supplements as what was used in this study will help them produce more pharmacists who can provide quality patient counselling to the underserved population of the deaf.

For future researchers, it is recommended to:

1. Further investigate into the learning outcomes brought about by these instructional materials by testing them with actual deaf patients.
2. Develop localized versions of this material into other languages of the country to be used by other grassroot health workers such as the rural health midwives, barangay health workers, and barangay

nutrition scholars, especially on those areas where primary health workers are not in good command of the language used in the instructional materials.

3. Incorporate such materials in the curriculums of other health programs involved in primary health care services such as Nursing, Midwifery, Medicine, Optometry, and Nutrition.

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