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Perceived Utilization of E-Prescription During Covid-19 Pandemic in Communities of Davao City

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A B S T R A C T

The occurrence of pandemic led to health services shifting and implementing a new method of giving service and that is Electronic Prescribing. Electronic prescribing (e-prescribing) was one of the innovations which were introduced in order for healthcare professionals and patients to lessen their interactions in dispensing medicines. In the Philippines, the government has issued Community Quarantine, and the Food and Drug Administration has seen a need to implement and adopt an alternative means of using electronic prescription for drugs for the benefit of individuals vulnerable to COVID-19. In Davao City, telephone medicine is being utilized to accept prescriptions, whether in the form of text messages or sent via email. The respondents of this study are the residents of Davao City, Philippines, ranging from ages 18–59 years old. People who reside outside Davao City are excluded from the study and those residents of Davao City who have utilized an e-prescription are included in the study. Only the main urban center of the said city is included. The mentioned main urban centers in the Davao City Infrastructure Development Plan and Capacity Building Project are the districts of Poblacion, Agdao, Buhangin, and Talomo. The overall findings showed that the majority of respondents were between the ages of 18-35 years old, female and are high school graduates. Results also showed that respondents who utilize recorded images as the format for electronic prescriptions. During the period of the pandemic, the majority of the respondents also used e-prescription anywhere from one to three times, most of them used e-prescription to relieve symptoms of illnesses and the majority of them used e-prescription to purchase antibiotics.

The researchers were able to evaluate and analyze the perceived utilization to electronic prescriptions among residents of Davao City in the community setting during the COVID-19 pandemic in order to fully implement the use of electronic prescriptions even after the pandemic, as the circular order from the Food and Drug Administration for the use of electronic means of prescription is only implemented until the quarantine is lifted. In conclusion, the use of e-prescription is heavily influenced by cognitive flexibility, technological literacy, convenience, and attitude. Therefore, the null hypothesis is rejected and the alternative hypothesis stating that there is a significant difference between the respondent's demographic profile and the level of perceived utilization to e-prescription among residents of Davao City during the COVID-19 pandemic is accepted.

Keywords: Covid-19, dispensing, electronic prescription; perceived utilization; demographic profile; cognitive flexibility; technology literacy; attitude; convenience; community pharmacy; davao city

1. Introduction

Countries around the world are involved with COVID-19, and the number of its current occurrences and deaths are increasing. Coronavirus disease 2019 (COVID-19) has escalated quickly throughout the world, leading to emergency medicine and physician-led triage, which is significant at this time [1]. Hospital pharmacies have extensively put up to avert and restrain the COVID-19 pandemic like many clinical teams. Due to this, pharmacies thus include managing drug therapies, overuse of certain drugs, insufficient medications, and possible medication errors [2].

In 2020, the World Health Organization (WHO) had proclaimed the novel coronavirus (COVID-19) to be a global pandemic, and as this situation surges globally, health services leave no choice but to shift into a new method of giving service. Electronic prescribing (e-prescribing) was one of the innovations which were introduced in order for healthcare professionals and patients to lessen their interactions in dispensing medicines [3]. However, presently, less is known and familiar about patients' perspectives on e-prescribing [4]. A structured review of the literature published between 2002 and 2012 incorporated 28 studies on the user experience of e-prescribing focused on the viewpoint of clinicians, predominantly medical, pharmacy and nursing staff. However, patients are not included in the review of the studies [5]. Moreover, the factors that promote the utilization of electronic prescribing could also be perceived as barriers to the administration of e-prescribing. It depends on the implementation stage of e-prescribing, which might change during the implementation process [6]. Some researchers noted that there might be an increase in medication errors and adverse drug effects if electronic prescribing is not appropriately designed and implemented [7].

Electronic prescription is being tested, implemented, or is still implemented according to the domestic needs in several countries [8]. Implementing the e-prescribing system leads to addressing the entire process involving the pharmaceutical services as it is a comprehensive health management tool [9].

In the Philippines, the government has issued Community Quarantine, and the Food and Drug Administration has seen a need to implement and adopt an alternative means of using electronic prescription for drugs for the benefit of individuals vulnerable to COVID-19. The goals of the said Circular is to assure that access to maintenance drugs, and prescription medicines are continuous despite the pandemic, assure that the process for the use of electronic prescriptions is both efficient and effective, and implement guidelines that will be followed in terms of dispensing drugs based on the electronic prescription. However, the effectiveness of the said Circular will only take effect during the quarantine and for the whole duration of the pandemic, and when the imposed quarantine is lifted, the said Circular will also automatically be lifted too [10].

In Davao City, telephone medicine is being utilized to accept prescriptions, whether in the form of text messages as long as the sender is Central 911 to accommodate patients who consulted from the volunteer doctors in telemedicine in coordination with 911 in the city, according to Executive Order No. 20, Series of 2020, which expands community quarantine in Davao City [11].

The study aims to evaluate the utilization of electronic prescribing in community pharmacy settings during the COVID-19 pandemic among residents of Davao City, Philippines.

1.1 Statement of the Problem

The study aims to evaluate the perceived utilization to e-prescription among residents of Davao City during the COVID-19 pandemic in the community pharmacy. With this, the researchers sought to answer the following questions in particular:

1. What is the respondent's demographic profile in Davao City in terms of:

    1. Age
    2. Sex
    3. Educational attainment
    4. Type of file format
    5. Number of e-prescription used
    6. Purpose of using e-prescription
    7. Type of prescription medication

2. What is the level on perceived utilization of e-prescription among residents of Davao City based on the following parameters:

    1. Cognitive flexibility
    2. Technology literacy
    3. Attitude
    4. Convenience

3. Is there a significant relationship between the respondent's demographic profile and their level of perceived utilization to e-prescription among residents of Davao City during the COVID-19 pandemic?

1.2 Research Objectives

General Objectives:

To determine the perceived utilization of e-prescription in the community pharmacy among residents of Davao City during the COVID-19 pandemic.

Specific Objectives:

1. Identify the demographic profile of the residents of Davao City in terms of age, sex, educational attainment, type of mobile use, type of file format, number of e-prescription, the purpose of using e-prescription, and type of prescription medication.
2. Determine the level of perceived utilization of e-prescription among residents of Davao City in terms of cognitive flexibility, technology literacy, attitude, and convenience.
3. Evaluate the significant relationship between the respondent's demographic profile and their level of perceived utilization of electronic prescription among residents of Davao City during the COVID-19 pandemic.

1.3 Hypotheses

The hypotheses of the study will be tested at a 0.05 level of significance:

HO: There is no significant relationship between the respondent's demographic profile and their level of perceived utilization of e-prescription among residents of Davao City during the COVID-19 pandemic.

HA: There is a significant relationship between the respondent's demographic profile and their level of perceived utilization of e-prescription among residents of Davao City during the COVID-19 pandemic.

1.4 Conceptual Framework

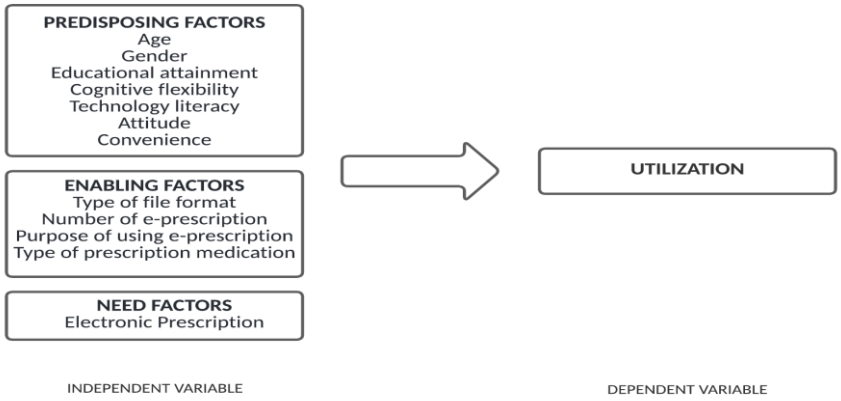

Figure 1 The Schematic Diagram of the Study

This Framework was adapted from Andersen's Healthcare Model, developed in the mid-1950s. According to this theory, the usage of healthcare services is always impacted by societal variables and individual behaviour and attitudes [12]. The model categorizes these factors into three main categories: predispose, enabling factors, and need factors (Andersen 1995). In this study's Framework, the predispose are Age, Sex, educational attainment, cognitive flexibility, technology literacy, attitude, and convenience. The enabling factors are the type of file format, number of e-prescription, the purpose of e-prescription, and the type of prescription medication. Also, the need factor is the electronic prescription. The mentioned categories are considered the Independent variables, while the dependent variable is referred to as Utilization.

1.5 Theoretical framework

Innovation is intervened in different ways, such as a new idea, method, or device in a process is done for society to adopt the innovation introduced to society, and for the outcome, a change is being observed [102]. Theories aligned in this study are the Theory of Diffusion of Innovation and The Andersen Healthcare Utilization Model in which may occur as an argument, a discussion, or rationale in the study that could correlate to the problem which is being stated [13]. The given explanation in every theory that correlates to the study is stated below.

Theory of Diffusion of Innovation

The diffusion of innovation theory developed by E.M. Rogers in the year 1962 that analyzes the members of the society in how they can adopt the new innovation presented in the society and how they made such a decision on the topic [14]. It is a hypothesis that outlines how a new technology's innovation is being spread to different parts of the society, From the introduction of advanced technology until the adaptation [15]. The theory also stated that the innovations should be adopted for the technology to develop and be upheld. As innovations occur worldwide, the diffusion of innovation theory, the expected outcome is to adapt an idea, behavior, or product by the members of the society. Furthermore, the key to why the members of the society adopt new things is because they perceive or consider the idea, behavior, or product introduced as an innovation [16].

The Andersen Healthcare Utilization Model

Ronald M. Andersen, a UCLA health services professor, created the initial model in 1968. The initial concept was expanded via multiple revisions, and its most recent form extends beyond the utilization of services to incorporate feedback loops [17]. Andersen's Healthcare Model is a conceptual model aimed at identifying the factors that lead to the use of health services. According to the model, the use of medical services (including inpatient care, doctor's consultation, dental care, etc.) is determined by three dynamics: predisposition, potential factors, and need. Predisposition may include characteristics such as race, age, and beliefs in health. For example, a person who believes that medical services effectively cure an illness is more likely to seek treatment. Factors that enable it include family support, access to health insurance, and your own community. Needs represent both the perceived and actual needs of medical services [12].

1.6 Significance of the Study

Due to the pandemic that is going on, the importance of the study is to be able to evaluate the perceived utilization to e-prescription among residents of Davao City during the COVID-19 pandemic in a community setting.

Patient

The findings of this study may provide overall patient satisfaction with the health system through e-prescription by allowing patients to manage their prescriptions electronically, which will improve medication safety, increase convenience, and lessen face-to-face interaction.

Pharmacist

The findings of this study will minimize the risk of medical errors when it comes to dispensing drugs due to manual or handwritten prescriptions. The pharmacists will dispense the right drug to the right patient, reducing the risk of adverse drug effects and improving quality of care and patient safety.

Prescriber

The findings of this study will make prescribing easier for physicians. e-Prescribing will reduce the loss of prescriptions since it can be directly sent to the pharmacies, and physicians will spend less time on prescription refill requests.

Society

The findings of this study will contribute to the benefit of society, considering that electronic prescribing plays an essential role in lessening the error in dispensing medications, face-to-face interactions, and enhancing the safety and quality of the prescribing process.

Researchers

The study will help the researchers uncover areas that many researchers could not explore. Thus, new findings of utilization on e-prescribing among the residents in Davao City may be arrived at.

1.7 Scope and Delimitation

The study will focus on determining the perceived utilization to e-prescription among residents in Davao City, Philippines, community pharmacy. This is a descriptive cross-sectional quantitative design; a validated self-made survey questionnaire developed by the researchers will be utilized to test the following variables: The variables are interdependent to each other, whereas the first variable is the demographic profile of the residents in Davao City and the other variable is the indicators in utilizing e-prescription. The respondents of this research will only focus on the residents of Davao City's main urban districts ages from

1.8 Expected Outcome

Millions of individuals have been infected by the global COVID-19 pandemic, which has resulted in a million fatalities globally. As a result, it has compelled healthcare providers to alter their care methods [18]. With the COVID-19 pandemic, places are on lockdowns and under the Enhanced Community Quarantine. Due to this, the Food and Drug Administration (FDA) imposed Circular No. 2020-007 [3]. This will allow the prescribers to quickly review, authorize and send prescription refills, freeing up pharmacists and staff members for more patient-focused tasks that do not consume substantial time. This study will also serve as a foundation for using electronic prescription for healthcare professionals and patients, specifically older adults and those who have co-morbidities and are at risk of infection. In line with these, the Department of Science and Technology's (DOST) 6Ps Project Output Guide is utilized to outline the intended outcomes and benefits of performing this research [19].

Publication

As technology advances through time, this study will be used as a reference for further studies regarding the utilization of electronic prescribing for the people residing in Davao City, Philippines, and the whole country. It will also serve as a stairway to the eventual deployment of an electronic healthcare system, which will solve several medical mistakes while also improving the efficiency and safety of the whole healthcare system.

Patent

When this study is successfully published, it will be expected to be patented that will give credit to the authors. This will also be exclusive for the researchers, and duplication of the study will not be allowed.

2. Methodology

This chapter presents the research methodology used by the researchers to conduct this study which includes the research design, sampling technique, population, locale of the study, research instrument, data analysis, survey questionnaires, and ethical considerations.

2.1 Research Design

This research will employ a descriptive cross-sectional research design to determine the significant relationship between demographic profile and acceptability of telemedicine services among hypertensive patients in Davao City. To elaborate, this research is descriptive in a way that it factually and accurately explains the situation or area of interest. It helps the researchers to describe and provide the current state of a certain variable which in this case is the current level of acceptability of telemedicine services among hypertensive patients in Davao City. Moreover, this study is cross-sectional since it contains the key characteristics of a cross-sectional design such as: It takes place at a single moment in time, it does not need interventions or manipulation of variables, it allows the proponents to look at multiple variables at once, it is used to examine the prevailing characteristics of a given population, and provide information about a current situation. Rather than cause and effect relationship, descriptive cross-sectional designs entail a systematic exploration of the nature of associations between and among variables. Descriptive cross-sectional design is used to describe the relationship between variables that happens naturally among them [20]. With this, The proponents of the research will conduct a survey with the respondents of the study in order to determine their level of acceptability to telemedicine services as well as the significant relationship between the demographic profile and the level of acceptability of telemedicine services in terms of attitude, perceived ease of use and perceived usefulness.

2.2 Respondents, Population and Sampling Techniques

The respondents of this study are the residents of Davao City, Philippines, ranging from ages 18–59 years old. People who reside outside Davao City are excluded from the study and those residents of Davao City who have utilized an e-prescription are included in the study. The questionnaire will include a question that will determine whether or not the selected respondent has utilized an electronic prescription. If the respondent has not utilized an electronic prescription, the data will be automatically disregarded. In addition, provided in table 1 are the inclusion and exclusion in selecting the respondents. This study informs potential respondents that they are being approached to participate in a research study to collect data. Their identities will be kept private from the general public, and only the researchers and the respondents themselves will have access to the study.

For the sampling technique, the researchers utilized stratified random sampling. This sampling is a type of probability sampling used to produce a sample population representing the entire population under the study. According to Hayes A (2021), the Stratified sampling technique also selects samples from a large population by separating them into homogeneous groupings called strata. Compared to simple random sampling, stratified random includes selecting data from a sample of a population at random, with each potential sample having an equal chance of occurring in the sample [21].

This study used the Raosoft Sample Size Calculator in determining the sample size that will be used. The Raosoft, Inc. form and survey software is a robust and dependable database management system that connects with other proprietary formats. Also, it is a software program mainly used to compute or produce the sample size for research or survey [22]. The confidence level that the researchers will use is 95% and a margin of error of 5%, and based on the calculation, 384 is the recommended sample size. In selecting the respondents, Davao City is composed of 11 administrative districts with 182 barangay [23]. Only the main urban center of the said city is included in this study. The mentioned main urban centers in the Davao City Infrastructure Development Plan and Capacity Building Project are the districts of Poblacion, Agdao, Buhangin, and Talomo [23]. The sample size will also be divided using percentages distributed based on their estimated population; 53 respondents from Poblacion, 42 respondents from Agdao, 119 respondents from Buhangin and 170 respondents from Talomo. The respondents will be randomly selected in each district. This location was picked since one of the researchers is also a resident of the said city.

Parameter	Inclusion	Exclusion
LOCATION	Davao City (Main Urban Center)	• Davao City (Sub-Urban, Tourist Development Zone, Economic Zone, and Rural) • Outside Davao City
AGE	Adult (18-59 years old)	• Minors (below 18 years old) and Senior Citizens (60+ years old)
E-PRESCRIPTION	User, already encountered e-prescription	

Table 1. *Inclusion and Exclusion*

2.3 Locale of the Study

The study will be conducted in Davao City, Philippines. The researchers will gather its respondents residing at Davao city specifically per District with the inclusion of urban areas with a population of 946,019, which is enough to gather the information that could be supplied to the study. As Davao City has 3 Congressional districts respectively and three districts, there are 11 Administrative districts with 182 barangays. The researchers will focus on the four main urban areas: the Poblacion district with 25 barangays, Agdao district with 11 barangays, Buhangin district with 13 barangays, and Talomo district with 14 barangays [23]. This study will be conducted in the first semester of the academic year 2021-2022.

Figure 2. *Map of Davao City*

2.4 Research Instrument

The researchers will use one instrument for the study. The researchers will use questionnaires which is one of the main elements of the survey. Questionnaires must have a question in which the researcher wants to find the answer in order for them to answer the given question or problem of their specific study. The researchers gathered together to brainstorm questions to be asked to the respondents. The researchers then decided to have a self-made questionnaire relevant to the study. Then the questionnaires will be submitted to the research adviser to be checked and for validation. After validating the questionnaires, the researchers will conduct pilot testing on 40 respondents based on exclusion and inclusion criteria to make the self-made questionnaires reliable. The pilot testing participants will receive the pilot testing tool via messenger and email. After the pilot testing, the researchers will make a google form that contains the validated self-made questions. The data and information obtained from the respondents of the pilot testing will all be deleted once the pilot testing is done. The researchers will ask for consent from the respondents regarding their information by including the data privacy act on the first part of the google forms in gathering data to secure their privacy. After the respondents respond to the consent, the google form link will be sent to the respondents via messenger and email. Since it is conducted online, the respondents can answer it anytime and have enough time to answer the following questions.

The questionnaires will consist of questions regarding the demographic profile of the respondents and the factors in utilizing e-prescription services among residents of Davao City during COVID-19. The questionnaire will also include a question that will determine whether or not the selected respondent has utilized an electronic prescription. If the respondent has not utilized an electronic prescription, the respondent will no longer be allowed to continue answering the survey. The respondents can choose to withdraw from the study. The data collected will be secured by the researchers through the use of google drive files**,** and the researchers are the ones who can only access the data. The data will remain secured from unauthorized persons. The data and information obtained from the respondents will all be deleted once the study has been completed.

2.5 Data Gathering/ Procedure

Quantitative cross-sectional design research will be conducted. In acquiring information, the researchers brainstormed and decided to have self-made survey questionnaires, which three validators will validate. A pilot testing will be conducted on 40 respondents. After the validation and pilot testing, the questionnaires will be disseminated and answered by respondents via a google form to evaluate the utilization of electronic prescribing of the residents during the pandemic in Davao City, Philippines. This study addresses the general public, particularly those in the community who often utilize traditional prescriptions or written prescriptions. This could lead to the promotion of electronic prescription and its benefits, convenience, and efficiency. The pharmacy student, with their initial knowledge of electronic means of prescription, will raise awareness and provide an advantage in the employment of electronic prescription. This research study will be under the provision of the researcher's mentor and the SPC-REC will monitor all the progress, corrections, and actions of the researcher to ensure the research study's validity and fairness.

Letter

In compliance with the COVID-19 pandemic restrictions, the researchers will send a letter to the barangay official of the chosen barangays through an email; the letter will contain the consent to release the complete list of the names of the barangay population and a consent to conduct the study in their barangay. After obtaining the list of population names, the researchers will use a Raosoft calculator to solve the number of sample sizes and conduct randomization on the population. The researchers will then reach out to the potential respondents via messenger by informing them first about our study and then asking for consent to participate.

Respondents

In order for the researcher to achieve the desired number of respondents, the researcher will ask for the guidance and help of the barangay officials via email in getting the qualified respondents according to the inclusion criteria set by the researchers. The said barangay officials are expected to suggest names of those who are qualified to become the possible respondents of the study. The researchers will message the suggested respondents via Facebook messenger to ask for permission to email them the consent if they are willing to participate.

Questionnaires

The researchers gathered together to brainstorm questions to be asked to the respondents. The researchers then decided to construct self-made questionnaires relevant to the study. Then the questionnaires will be submitted to the three validators to be checked for validation. After validating our questionnaires, the researchers will conduct pilot testing on 40 respondents for credibility. Then the researchers will proceed to make a google form that contains the informed consent form and the validated questions. The researchers will ask for consent from the respondents by including the data privacy act on the first part of the google forms in gathering data to secure their privacy. After the respondents respond to our consent, the google form link will be sent to the respondents via messenger and email. The questionnaire will include a question that will determine whether or not the selected respondent has utilized an electronic prescription. If the respondent has not utilized an electronic prescription, the data will be automatically disregarded. Since it is conducted online, the respondents can answer it anytime and have enough time to answer the following questions.

The questionnaires will consist of questions regarding the demographic profile of our respondents, electronic prescription, and their level of utilization of electronic prescription during the pandemic. The respondents can choose to withdraw from the study.

The data collected from the google forms will automatically be generated and coded to a google sheet in an arranged manner according to the sequence of the questions in the questionnaire. It will be secured by the researchers through the use of google drive files**,** and the researchers are the ones who can only access the data. The data will remain secured from unauthorized persons. The data and information obtained from the respondents will all be deleted once the study has been completed.

Confidentiality

The research survey will be done online through the use of google forms. The respondent will be contacted by the researchers via private messages. The researcher will send the link to survey questionnaires, as this link will tend to go beyond the researcher's control. The results that will be gathered will automatically be generated and coded through a google sheet and will be secured through a google drive. Researchers will not share any information about the respondents with anyone outside the research team. The information collected from this research project will be kept private and will not be shared with or given to anyone. The researcher will ensure that all the information gathered from the respondent is secured. It will not be shared with or given to anyone except the research adviser and the researchers.

Right to Refuse or Withdraw

The respondents have the right to refuse to participate in this research study. If the Respondents do not want or are not comfortable doing so, they have the right to not participate in this study. The respondents can withdraw their participation any time they want without affecting themselves in any way.

Once the respondents are done answering the questions in the prepared survey questionnaire, they will be given an e-certificate of appreciation. The respondents can ask for a copy of their answers. The researchers will also assure them that no file/data will be retained and utilized for reasons other than this study. All information received will be kept with the strictest confidentiality. Once the final paper is completed, all data gathered from the respondents will be permanently deleted.

Post Data Collection Procedure

The Post-data collected results in the study will be disclosed especially to the respondents of the study. The gathered data will only be under the researchers' control and will be stored in a Google Drive account during the period of the study (i.e., email, socio-demographic profile, and answered survey tools). Subsequently, two to three months after the utilization of the data and completion of the study, it will all be removed along with all traces of information collected, to avoid potential unlawful processing without the respondents' permission. Transparency also guarantees that no potentially identifiable information is included in any reports or documents distributed. The respondents will have the google form copy of their answers as well as the information they provided on the questionnaire.

The data are handled ethically in accordance with IRB-approved guidelines, which include a thorough commitment to confidentiality by ensuring that no identifiable information is included in the report or presentation. After a successful finalization of the study, a hard bound copy will be printed out and made accessible to read for future references and claims especially for the respondents who participated in the study as well as to the students of San Pedro College.

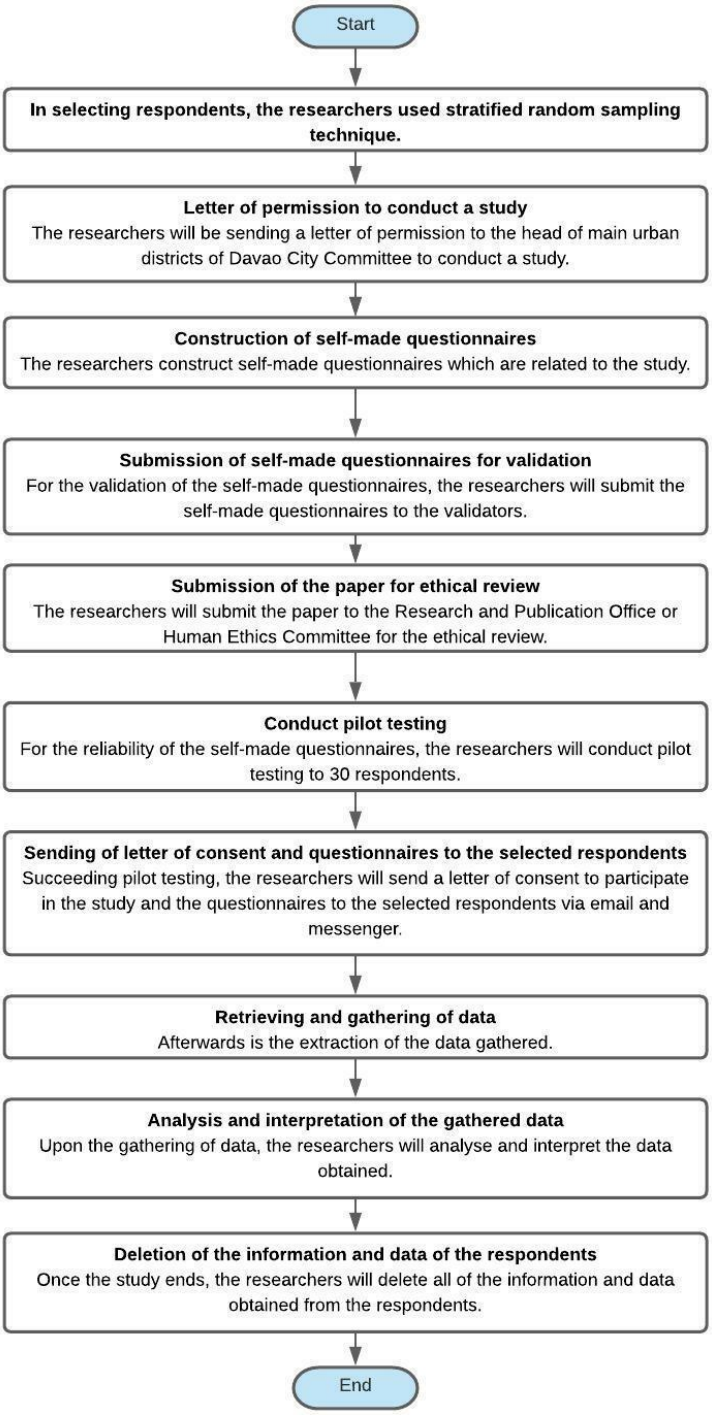

Figure 3. *Schematic diagram*

2.6 Data Analysis (Statistical Tool)

Descriptive statistics will be employed using Frequencies and percentages. There will be a 384 total number of respondents participating in the study. Frequencies and percentages will be used in determining the demographic profile of respondents in terms of Age, Sex, Educational attainment, Type of file format, Number of e-prescription used, Purpose of using e-prescription, and Type of prescription medication.

Inferential statistics will be used to determine the meaningful relationship between the dependent and independent variables of the study. A Chi-square test will be used to determine the significant difference between the demographic profile of the residents in terms of Sex, type of file format, number of e-prescription used, the purpose of using e-prescription, and type of prescription medication their usage towards electronic prescription. Spearman's Rho will be used to determine the significant relationship between the respondent's demographic profile to their level of utilization of electronic prescription.

Further, Spearman's rank-order correlation coefficient will be used to determine the significant relationship between the demographic profile of the residents in terms of age and educational attainment and their utilization of electronic prescription.

2.8 Ethical Consideration

This study aims to evaluate and measure the level of perceived utilization to e-prescription among the residents of Davao City during the COVID-19 pandemic. Upon conducting the study, a letter will be addressed to the barangay captain of the randomly chosen barangay, requesting permission to perform the study in their barangay and maintaining confidentiality. The researchers will give the respondents an Informed Consent Form followed by an online survey questionnaire administered via google forms. The researchers will solely act as investigators and not as respondents in the study. The respondent's healthcare provider may also serve as a respondent but not as an investigator. Considering that it is an online platform, the researchers will strictly follow the rules and regulations implemented under RA no. 10173 or the Data Privacy Act of 2012.

The Informed Consent Form will contain brief information and the purpose of the study. The researchers will also include information about the risks and benefits of the study. The respondents will be free to choose between participating in the study. The researchers will also offer respondents to continue or withdraw from the study based on an agreement reached by both sides. In order to ensure that the respondents' privacy is protected, the researchers will inform the respondents that disclosing their names in the provided questionnaire is optional.

The interpreted data will be presented and discussed in Chapter 3: Results and Discussion. In Chapter 4, the study's conclusion will be reached and the whole research manuscript will be compiled into a journal containing an abstract, introduction, methodology, results and discussion, and conclusion which will be published in the International Journal of Science Research (IJSR).

Furthermore, the researchers will inform the respondents that the data provided will not be duplicated without permission. There will be no references to any specific respondents in the research findings or reports. With this, the data will be entirely anonymous, and they will have the right to view their data. The respondents will also have the right to contact the researchers if they choose to remove their records or know more detailed information about the study.

3. Results and Discussion

This chapter presents in detail the overall data of the study which aims to determine the perceived utilization to e-prescription in the community pharmacy among residents of Davao City during the COVID-19 pandemic. The results were presented in tabular form to assess if the demographics of the respondents will influence the level of perceived utilization to e-prescription among residents of Davao City during the COVID-19 pandemic.

3.1 Predisposing factor

3.1.1 Demographic Profile of the Respondents

Profile	**Category**	***f***	**% Distribution**
Age	**18-35 years old**	**292**	**75.7**
	36-55 years old	70	18.1
	56-60 years old	24	6.2
Sex	**Female**	**236**	**61.1**
	Male	150	38.9
Educational Attainment	Elementary graduate	6	1.6
	Highschool graduate	**187**	**48.4**
	Vocational	29	7.5
	Bachelor's degree	137	35.5
	Postgraduate	27	7.0

Table 2. *Demographic Profile of the Respondents*

The demographic profile of the respondents were presented in Table 2. A total of 384 participants responded. The age distribution was made of the following: 18-35 (75.7%); 36-55 (18.1%); and people aged 56-59 (6.2%). For the sex distribution, 236 of the respondents were female (61.1%) while 150 reported to be male (38.9%). In terms of educational attainment, (1.6%) of the respondents were elementary graduates, (48.4%) were high school graduates, (7.5 %) were vocational, (35.5 %) had a bachelor's degree, and (7 %) were post graduates.

3.1.2 Level of Perceived Utilization in terms of Cognitive Flexibility

Learning e-prescription is fundamentally easy.	4.15	0.8557	Great extent
Everyone should be prepared to accept future adjustments while using electronic means of prescriptions.	4.39	0.7352	Great extent
Using E-prescription for my prescription needs is a thing that I can connect willingly.	4.21	0.7806	Great extent
E- prescription is manageable to cope with	4.20	0.7757	Great extent
E-prescription reduces the risk of medication error.	4.06	0.9009	Great extent
E-prescription is a better idea compared to the traditional method.	4.00	0.9272	Great extent
Overall Mean	**4.17**	**0.6118**	**Great extent**

Table 3. *Cognitive Flexibility*

Based on the data presented on table 3, the level of perceived utilization of e-prescription of the residence of Davao City in terms of Cognitive flexibility has a grand mean of 4.17 which is interpreted as great extent. Among all statements included in measuring cognitive flexibility, statement 2, which is "*Everyone should be prepared to accept future adjustments while using electronic prescriptions.*" has the highest mean score of 4.39 and is interpreted to a great extent. While statement 6 which is "*E-prescription is a better idea compared to the traditional method."* has a least mean which is 4.00 but still has the interpretation of great extent.

3.1.2 Level of Perceived Utilization in terms of Technology Literacy

In utilizing the electronic means of prescription, one should have knowledge in using mobile gadgets such as cellphones and tablets.	4.32	0.7831	Great extent
In using the electronic means of prescription, one should know how to make use of mobile gadgets such as cellphones and tablets.	4.37	0.7386	Great extent
In using electronic means of prescription methods, one should know how to utilize different messaging tools such as viber, messenger, emails, and telegram.	4.32	0.7925	Great extent
The procedure of uploading and downloading files/photos to and from a media platform should be familiar to everyone.	4.36	0.7639	Great extent
One should know how to communicate with 4 via email and other messaging applications.	4.37	0.7903	Great extent
It is simple to organize, save and store the found information.	4.18	0.7950	Great extent
Overall Mean	**4.32**	**0.6236**	**Great extent**

Table 4. *Technology Literacy*

Table 4 presents the results on technology literacy. According to the table, the grand mean of the six statements is **4.32** which is interpreted as a great extent in technology literacy. Among these six statements, statement 2 & 5 which is "*In using the electronic prescription, one should know how to make use of mobile gadgets such as cellphones and tablets.*" and "*One should know how to communicate with 4 via email and other messaging applications."*, has the highest mean score of 4.37 which is interpreted to a great extent.

Understanding the impact of technical frames on the efficacy of electronic prescription use may provide insight into future health information technology advancements [17].

3.1.3 Level of Perceived Utilization in terms of Convenience

Using an electronic means of prescription is preferable than a traditional prescription.	3.99	0.8782	Great extent
It is easier to buy using an electronic means of prescription to buy medication for other people.	4.10	0.8520	Great extent
It is comfortable to use the electronic means of prescription.	4.14	0.8617	Great extent
Using an electronic means of prescription can save time.	4.33	0.7722	Great extent
It is accessible to use the electronic means of prescription.	4.19	0.8319	Great extent
Information and instructions regarding medications in electronic means of prescription are easier to obtain.	4.21	0.8219	Great extent
Overall Mean	**4.16**	**0.6659**	**Great extent**

Table 5. *Convenience*

Table 5 presents the results from the gathered data about the Convenience. Based on the table, the statements garnered a grand mean score of **4.16** which is interpreted as Great extent. Among these six statements, statement 2, which is *"Using an electronic prescription can save time",* has the highest mean score of 4.33 which is interpreted as Great extent. On the other hand, statement 1, which is *"Using an electronic means of prescription is preferable than a traditional prescription.",* has the least mean score of 3.99 which is interpreted as Great extent. According to the results of the study entitled "Older Adults' Perceptions of E-Prescribing: Impact on Patient Care" by Schleiden, et al. (2015), The majority of respondents (84%) expected and preferred e-prescriptions to paper prescriptions (81 percent). Because of the enhanced convenience, increased patient-provider communication, and the perception of superior care, e-prescribing may have a considerable impact on patient medication-taking behaviors when compared to traditional paper prescribing [24].

3.1.4 Level of Perceived Utilization in terms of Attitudes

Utilizing electronic means of prescription has a positive impact on the healthcare system.	4.27	0.7585	Great extent
Everyone should be knowledgeable about using the electronic means of prescription.	4.33	0.7454	Great extent
Implementing electronic means of prescriptions is something everyone should be open to learning and adopting.	4.29	0.7795	Great extent
Using an electronic means of prescription causes anxiety.	3.11	1.2615	Moderate extent
The use of electronic prescriptions has brought more positive experiences than negative ones.	4.02	0.7709	Great extent
When the electronic prescription system is fully established, it will be used indefinitely.	4.11	0.8519	Great extent
Overall Mean	**4.02**	**0.5755**	**Great extent**

Table 6. *Attitude*

Table 6 showed the Attitudes of respondents in terms of Utilization of prescriptions in Davao City. The statements included a grand mean score of 4.02 which is interpreted as Great extent. The statement that has the highest mean score of 4.27 is statement 1, which is "*Utilizing electronic prescription has*

a positive impact on the healthcare system.", and it is interpreted as high. In contrast, the statement that garnered the least mean score of 3.11 is statement 4, which is "*Using an electronic prescription causes anxiety."* which is interpreted as Moderate extent.

3.2 Enabling factors

Type of file format of e-prescription	Captured image	223	57.8
	JPEG	98	25.4
	PDF	56	14.5
	Others	5	1.3
Number of times you have use e-prescription	1-3 times	291	75.4
	4-6 times	86	22.3
	More than 7 times	9	2.3
Purpose of using E-prescription medication	Relieve symptoms	258	66.8
	Cure disease	62	16.1
	Improve functioning	20	5.2
	Maintenance	44	11.4
	Others	2	.5
Types of Prescription Medication	Antibiotic	277	71.8
	Antihistamine	21	5.4
	Antidiabetic	25	6.5
	Antiplatelet	16	4.1
	Antigout	1	.3
	Antihypertensive	14	3.6
	Antidepressant	1	.3
	Antiasthmatic	26	6.7
	Anticoagulant	3	.8
	Antiemetic	1	.3
	Antifibrinolytic	1	.3

Table 7. *Enabling Factors*

The type of file format of E-prescription shows that 57.8% of the respondents used captured images for the type of electronic prescription, 25.4 % used JPEG format, 14.5 % used PDF format and 1.03% used other types of formats like text messages and PNG. In terms of the number of times they have used the electronic prescription, 75.4% of the respondents have used the e-prescription 1-3 times, 22.3% have used it 4-6 times and 2.3% have used the e-prescription more than 7 times. A total of 386 participants responded in terms of the Purpose of using E-prescription medication, (66.8%) used e-prescription to relieve symptoms (16.1%) to cure diseases, (5.2%) to improve functioning, (11.4%) used e-prescription for maintenance and .5% for others. For the type of prescription medication, 71.8% of the respondents responded to antibiotic, 6.6% for Antidiabetic, 6.7% for antiasthmatic, 5.4% for antihistamine, 3.6% for antihypertensive, 0.8% for anticoagulants, 0.3% for antigout, 4.1% for antiplatelet, 0.3% for antidepressants, 0.3% for anti-emetic and 0.3% for antifibrinolytic. As per the official website of the TGP or The Generic Pharmacy, it was stated that the top 4 medicines that is being

prescribed in the Philippines are the antibiotics, metformin, albuterol and antihistamines which is we can correlate with our results as it was same with the data provided by the TGP.

Statistical analysis

To determine if there is an existing significant relationship between respondents demographic profile and their perceived utilization to electronic prescription during Covid-19 pandemic, inferential statistics was utilized and results are shown in table 10.

4.3 Testing the Significant Relationship between the Respondents Demographic Profile and their Level of Utilization of E-prescription

Test Variables		**X^2**	**P value**	**Remarks***
Age	Cognitive flexibility	51.472	0.455	Not significant
	Technology literacy	50.656	0.369	Not significant
	Attitudes	68.675	0.086	Not significant
	Convenience	36.535	0.812	Not significant
Sex	Cognitive flexibility	19.947	0.277	Not significant
	Technology literacy	16.292	0.439	Not significant
	Attitudes	24.264	0.147	Not significant
	Convenience	8.594	0.898	Not significant
Educational attainment	Cognitive flexibility	71.215	0.371	Not significant
	Technology literacy	94.898	0.007	**Significant**
	Attitudes	93.647	0.044	**Significant**
	Convenience	89.956	0.007	**Significant**
Type of file format	Cognitive flexibility	129.444	0.642	Not significant
	Technology literacy	103.420	0.946	Not significant
	Attitudes	101.189	0.997	Not significant
	Convenience	108..830	0.758	Not significant
Frequency of e-prescription utilization	**Cognitive flexibility**	416.799	0.000	**Significant**
	Technology literacy	63.314	0.068	Not significant
	Attitudes	45.148	0.799	Not significant
	Convenience	37.564	0.776	Not significant
Purpose of using e-Prescription	**Cognitive flexibility**	200.857	0.000	**Significant**
	Technology literacy	88.371	0.244	Not significant
	Attitudes	271.596	0.000	**Significant**
	Convenience	85.598	0.189	Not significant

Type of prescription medication	Cognitive flexibility	180.307	0.624	Not significant
	Technology literacy	191.952	0.195	Not significant
	Attitudes	149.719	0.996	Not significant
	Convenience	227.596	0.001	**Significant**

Table 8. *Testing the Significant Relationship between the Respondents Demographic*

Profile and their Level of Utilization of E-prescription

***Calculation was performed at 0.05 level of significance**

According to the findings of the statistical analysis, the respondents' level of educational attainment is a significant predictor ($p< 0.05$) variable in the utilization of e-prescription among patients when tested based on their level of familiarity with technology, their attitudes toward it, and its convenience. Patients' views and educational levels toward e-prescription systems were investigated in studies conducted in Australia [127] and Scotland [x] prior to their implementation. Patients' attitudes toward ePrescription were largely positive in these investigations. People with a higher level of education have better health, as evidenced by high self-reported health and low rates of morbidity, mortality, and disability. Low educational attainment is thus linked to self-reported poor health, a shorter life expectancy, and a lower chance of survival when sick [25].

The cognitive flexibility of respondents has a significant impact ($p< 0.05$) on both the frequency with which they use e-prescription and the purpose for which they use it. Given the circumstances, cognitive flexibility is considered to be one of the most important determinants of a person's ability to adapt to changes in the environment, such as the use of e-prescriptions [27]. According to Serrien et al., our decision-making is aided by two antagonistic types of cognitive control: stability and flexibility, which allow us to maintain established goals while also updating them as needed, as demonstrated by the respondents' cognitive flexibility [26]. Meanwhile, it was also discovered that the degree of views held by respondents had a significant impact ($p< 0.05$) on the purpose of utilizing e-prescriptions. Additionally, results showed that the ease of utilizing an e-prescription to purchase prescribed drugs had an impact on the kind of medication that was prescribed via an electronic prescription. According to Porterfield et al, the capacity to electronically submit and receive prescriptions has streamlined the clinical practice workflow, improving patient satisfaction and compliance. It gives patients more affordable drug options [8].

4. Summary, Conclusion, and Recommendation

This chapter provided in detail the overall data acquired in the survey phase of the investigation. It intends to examine the adoption of electronic methods of prescription among inhabitants of Davao City during the COVID-19 epidemic at the community pharmacy. Descriptive and inferential statistics were applied to analyze if there is a significant association between demographic profile and their level of perceived utilization to electronic methods of prescription.

Demographic Profile

The demographic profile of the respondents was tallied according to age, sex, educational attainment, type of file format or e-prescription, frequency of e-prescription utilization, purpose of utilizing e-prescription, and type of prescription medication. The respondents were also asked about the frequency of their use of e-prescriptions. The findings of the survey as a whole are shown in table 8.

4.1 Demographic Profile of the Respondents

Profile	**Category**	***f***	**% Distribution**
Age	18-35 years old	292	75.7
	36-55 years old	70	18.1
	56-60 years old	24	6.2
Sex	Female	236	61.1
	Male	150	38.9
Educational Attainment	Elementary graduate	6	1.6

	Highschool graduate	187	48.4
	Vocational	29	7.5
	Bachelor's degree	137	35.5
	Postgraduate	27	7.0
Type of file format of e-prescription	Captured image	223	57.8
	JPEG	98	25.4
	PDF	56	14.5
	Others	5	1.3
Number of times you have use e-prescription	1-3 times	291	75.4
	4-6 times	86	22.3
	More than 7 times	9	2.3
Purpose of using E-prescription medication	Relieve symptoms	258	66.8
	Cure disease	62	16.1
	Improve functioning	20	5.2
	Maintenance	44	11.4
	Others	2	.5
Types of Prescription Medication	Antibiotic	277	71.8
	Antihistamine	21	5.4
	Antidiabetic	25	6.5
	Antiplatelet	16	4.1
	Antigout	1	.3
	Antihypertensive	14	3.6
	Antidepressant	1	.3
	Antiasthmatic	26	6.7
	Anticoagulant	3	.8
	Anti-emetic	1	.3
	Antifibrinolytic	1	.3

Table 9. *Demographic Profile*

The overall findings showed that the majority of respondents were between the ages of 18 and 35 (75.7%), women (61.1%), high school graduates (48.4%), and those who utilize recorded images as the format for electronic prescriptions (57.8%). During the period of the pandemic, the majority of the respondents used e-prescription anywhere from one to three times (75.4%), the majority of them used e-prescription to purchase antibiotics, and most of them used e-prescription to relieve symptoms of illnesses (66.8%).

Factors of Utilizing E-Prescription

E-prescribing has been proposed as a means to improve operational efficiency, lower clinical risk management costs, and enable access to electronic patient information. It is possible to cut down on the number of negative medication reactions by implementing clinical risk management and improving communication. The researchers in this study are interested in determining the elements that influence people's decisions to use e-prescriptions during the COVID-19 epidemic. Specifically, they are focusing on cognitive flexibility, technological literacy, convenience, and attitudes. The findings of the survey as a whole are presented in table 9.

4.2 Overall Mean of Various Factors that Influenced the Utilization of e-prescription

ITEMS	**Mean**	**SD**	**Description**
COGNITIVE FLEXIBILITY			
Learning e-prescription is fundamentally easy.	4.15	0.8557	Great extent
Everyone should be prepared to accept future adjustments while using electronic means of prescriptions.	4.39	0.7352	Great extent
Using E-prescription for my prescription needs is a thing that I can connect willingly.	4.21	0.7806	Great extent
E- prescription is manageable to cope with	4.20	0.7757	Great extent
E-prescription reduces the risk of medication error.	4.06	0.9009	Great extent
E-prescription is a better idea compared to the traditional method.	4.00	0.9272	Great extent
Overall Mean	**4.17**	**0.6118**	**Great extent**
TECHNOLOGY LITERACY			
In utilizing the electronic means of prescription, one should have knowledge in using mobile gadgets such as cellphones and tablets.	4.32	0.7831	Great extent
In using the electronic means of prescription, one should know how to make use of mobile gadgets such as cellphones and tablets.	4.37	0.7386	Great extent
In using electronic means of prescription methods, one should know how to utilize different messaging tools such as viber, messenger, emails, and telegram.	4.32	0.7925	Great extent
The procedure of uploading and downloading files/photos to and from a media platform should be familiar to everyone.	4.36	0.7639	Great extent
One should know how to communicate with 4 via email and other messaging applications.	4.37	0.7903	Great extent
It is simple to organize, save and store the found information.	4.18	0.7950	Great extent
Overall Mean	**4.32**	**0.6236**	**Great extent**
C. CONVENIENCE			

Using an electronic means of prescription is preferable than a traditional prescription.	3.99	0.8782	Great extent
It is easier to buy using an electronic means of prescription to buy medication for other people.	4.10	0.8520	Great extent
It is comfortable to use the electronic means of prescription.	4.14	0.8617	Great extent
Using an electronic means of prescription can save time.	4.33	0.7722	Great extent
It is accessible to use the electronic means of prescription.	4.19	0.8319	Great extent
Information and instructions regarding medications in electronic means of prescription are easier to obtain.	4.21	0.8219	Great extent
Overall Mean	**4.16**	**0.6659**	**Great extent**
D. ATTITUDES			
Utilizing electronic means of prescription has a positive impact on the healthcare system.	4.27	0.7585	Great extent
Everyone should be knowledgeable about using the electronic means of prescription.	4.33	0.7454	Great extent
Implementing electronic means prescription is something everyone should be open to learning and adopting.	4.29	0.7795	Great extent
Using an electronic means of prescription causes anxiety.	3.11	1.2615	Moderate extent
The use of electronic prescriptions has brought more positive experiences than negative ones.	4.02	0.7709	Great extent
When the electronic prescription system is fully established, it will be used indefinitely.	4.11	0.8519	Great extent
Overall Mean	**4.02**	**0.5755**	**Great extent**

Table 10. *Overall Mean of Various Factors that Influenced the Utilization of e-prescription*

Legend: 1.0-1.5 = Very Low Extent; 1.51-2.50 = Low Extent; 2.51-3.50 = Moderate Extent; 3.51-4.50 = Great Extent; 4.51-5.00 = Very Great Extent

E-prescriptions, often known as electronic prescriptions, are an essential component of the national initiative to improve the overall safety and effectiveness of the prescribing process. It is possible to use it as a standalone system or as a component of an integrated electronic health record system, and it gives medical professionals in ambulatory care settings the ability to electronically transmit prescriptions to pharmacies. According to the findings, cognitive flexibility was shown to have a significant impact on the usage of e-prescriptions to a large extent, with an overall mean response value of 4.17. Previous research on aging and cognitive flexibility has used measures that require adapting to novel associations learned during a laboratory task, and it has shown that older adults are often worse at adapting to changing situational demands than younger adults, and this difference is commonly attributed to an age-related decline in acquiring and updating information [x]. The structural and functional implications of normal aging's cognitive changes, as well as the prevalence and cognitive consequences of age-related disorders With age, cognitive flexibility deteriorates, making it difficult to quickly adapt to new events and environments. Given the importance of cognition in maintaining functional independence and effective communication with others, it's critical to comprehend these age-related cognitive changes [28].

While this is going on, technological literacy is also a driver of the usage of e-prescription, which has a mean value response of 4.32. Based on the study about technology literacy as a barrier to Telehealth during COVID-19, it showed that despite having a proactive mind, when a patient doesn't know how to book for their online appointment this will result in inability to access telehealth [29].

Electronic prescriptions have been pushed by the use of advanced technology in healthcare as well as government policies. Electronic prescription is the primary method for addressing the major drawbacks of paper-based medication prescription, such as transcription errors [30].

In the meanwhile, the total mean answer values for convenience and attitudes were 4.16 and 4.02, respectively, which shows a significant degree of effect on the use of e-prescriptions. Based on the study of Imlach et al. (2021), e-prescription has been more efficient and more convenient for patients to use and it shows prospective on how e-prescribing could be improved [3]. According to Gagnon et al. (2014), A positive attitude toward e-prescribing has a significant impact on acceptance of the technology or e-system, whereas a negative attitude has a negative impact on acceptance of the said e-prescription. In line with this, the study claims that attitude has a significant impact on e-prescribing implementation [4].

Conclusion

The importance of electronic prescription was highlighted particularly during the COVID-19 pandemic in order to obtain the co-morbid patient's medication in the pharmacy without having to interact with a pharmacist face to face. In the study, the researchers were able to evaluate and analyze the perceived utilization to e-prescription among residents of Davao City in the community setting during the COVID-19 pandemic in order to fully implement the use of electronic prescription even after the pandemic because as the circular order from the Food and Drug Administration for the use of electronic prescription is only implemented until the quarantine is lifted.

According to the findings, the use of e-prescriptions is heavily influenced by cognitive flexibility, technological literacy, convenience, and attitudes. When tested on their level of familiarity with technology, attitudes toward it, and its convenience, respondents' educational attainment is a significant predictor variable in the use of e-prescription among patients. The frequency with which respondents use e-prescription and the purpose for which they use it are both influenced by their cognitive flexibility. It was also discovered that respondents' levels of opinion had a significant impact on the purpose of using e-prescriptions. Furthermore, the ease with which an e-prescription could be used to purchase prescribed drugs had an impact on the type of medication prescribed via an electronic prescription. Therefore, the null hypothesis is rejected and the alternative hypothesis stating that there is a significant relationship between the respondent's demographic profile and the level of perceived utilization to e-prescription among residents of Davao City during the COVID-19 pandemic is accepted.

Recommendation

The researchers were able to evaluate and analyze the utilization of electronic prescription in Davao City during COVID-19 pandemic through a survey questionnaire sent via an online platform, google form. Thus the researchers recommend future researchers to conduct the study in the following:

1. The findings of this research are limited to Davao City residents alone. Therefore, the results may not even be inclusive of the entire country. It is recommended that more study be undertaken on diverse Philippine communities, since results may vary based on location.
2. Conduct the survey in a face-to-face manner even in the remote areas of the city.
3. To widen the range of data gathering, survey tools must also be available in printed copies.
4. For the patients they should have to manage their prescriptions online to improve drug safety, increase convenience, and reduce face-to-face contact.

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