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Customers' Awareness and Views on Online Pharmacies during the Covid-19 Pandemic

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Abstract:- Amidst the pandemic, the continuation of proper healthcare dissemination is threatened as people are now forced to undergo self-quarantine and other safety protocols that hinder our way of life. To adapt to the "new normal," the researchers wanted to explore the services offered by online pharmacies; hence we aimed to identify the respondents' awareness and views of online pharmacies during the COVID-19 pandemic to help bridge the gap with online pharmacies. This research employs a cross-sectional quantitative – nonexperimental design, utilizing a descriptive technique, was conducted to examine the feasibility of online pharmacies in Davao City. Four hundred eighty-six (486) responses were collected using a simple random sampling technique across all of Davao City, and only 90.33% (439) were used, analyzed, and interpreted in this study. The results showed that despite the growing concern regarding its safety and the lack of awareness in most respondents, there is generally a positive response on the acceptance, practicability, and perceived advantages of online pharmacies during the pandemic. The statistical analysis revealed that there are significant relationships ($p < 0.05$) between the age ($p = 0.002$) and income ($p = 0.021$) of the respondents with online pharmacy awareness. Furthermore, the respondents' monthly family income also significantly influenced their views on the acceptability ($p = 0.004$) and safety ($p = 0.013$) of online pharmacies. However, as online pharmacies are not yet well established in Davao City, the current findings certainly prove that online pharmacies, if well established, are acceptable and a feasible supplement to existing public healthcare infrastructure.

Keywords:- *Online Pharmacy, Customers, Awareness, Views, COVID-19.*

I. INTRODUCTION

Online pharmacies, also known as internet pharmacy or e-pharmacy, are vendors that sell medicine through the internet. An early definition by Fung *et al*. (2004) describes online pharmacies as an internet-based vendor that may be an independent internet-only pharmacy, an online extension of a "brick-and-mortar" pharmacy, or a collaboration of pharmacies[1]. Key advantages such as convenience and efficiency, accessibility, privacy, and doorstep delivery are present in online pharmacy services unlike physical outlets of pharmacies (Ndem *et al*., 2019)[2]. With the emergence of the COVID-19 pandemic, using different business models such as online platforms to minimize face-to-face interaction has become an alternative to provide consumers their health necessities.

Changes in internet practices are expected to outlast the COVID-19 pandemic across borders[3]. In India, the pandemic-induced lockdown benefited online pharmacies the most, and these prohibitions pushed shoppers to adjust their daily purchasing behaviors, including purchasing medicines digitally (Sangani, 2020)[4]. Even before the outbreak of the global pandemic, the online pharmacy industry in India is already a big trend and is accumulating big revenues with around US$512 million in 2018 alone. Due to the impact of COVID-19, the compound annual growth rate (CAGR) of India in online pharmacy alone is estimated to grow at 63% and reach an additional of US $3 billion by 2022 (Goyal *et al*., 2020)[5]. The pharmaceutical industry has contributed significantly to economic growth both before and during the pandemic. Annually, the pharmaceutical market has been growing by 5.8% since 2017, accumulating a market revenue of US $1 trillion worldwide[6]. As estimated, it will reach US $1462 in 2021 (González Peña *et al*., 2020) due to the high demand for medicines, especially concerning the current health crisis, where almost everybody is very cautious and conscious about their health[7].

With the emergence of developing technology and the current health crisis, the industry of online pharmacy has expanded. However, the public still lacks knowledge regarding the availability, system, or even the existence of online pharmacies, and many of them still doubt its reliability. Awareness affects how an individual views the matter. A study by *Ndem et al*. (2019) explores Uyo Metropolis, Nigeria, and found an overall low awareness of online pharmacy services' presence and availability[2]. The study discovered that only 28% of respondents were aware of online pharmacies and that only 3% had purchased from them before. In addition, the perception thereof influences how amenable consumers are in availing of these services. The study of Bellman *et al*. (1999) entitled "Predictors of Online Buying Behavior" explores such factors or "predictors" and has also identified that gender, age, and education all have a positive relationship with online shopping[8]. The information for the predictors used by Bellman *et al*., the gender, age, and monthly income, can all be obtained from the consumer. This data can then be collated to form the respondents' demographic profile.

Due to the limited published data on online pharmacies in the Philippines, Filipino consumers' awareness and views need to be assessed not only to look at the feasibility of online pharmacies in Davao City as a response to the increasing trend of e-commerce and online shopping but also to bridge the knowledge gap of consumers regarding online pharmacies. In the context of the crisis, online pharmacy

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services would help by minimizing patient encounters while ensuring the same quality of service (present in community pharmacies) can still be provided, all the while keeping in mind that the utilization of these services is tied to public awareness that such services exist in the first place. With the rationale of needing to find the reasons for such unawareness, this study aims to gather its participants' demographic profile and determine their awareness and views towards online pharmacy services in Davao City.

II. METHODS

A. Research design

This research employed a cross-sectional quantitative–nonexperimental design utilizing descriptive technique. Quantitative research design is a formal, systematic process that aims to describe and test relationships using numerical data obtained from the participants' variables. Descriptive research is a quantitative method used to describe the distribution of one or more characteristics of a group of individuals. This design was used given that this study aims to identify the awareness and views of customers with different socio-demographic profiles residing in Davao City towards online pharmacies.

B. Population and Sampling procedure

The study's population consisted of residents of Davao City between 18 to 60 years of age. Using the OpenEpi software calculator, the researchers conducted a simple random sampling of the 1,825,000 population of Davao City. To get a 95% confidence level with a 5% margin of error, the minimum number of respondents for this research would have to be 385. With this in mind, the researchers have endeavored to include as many eligible participants to increase the confidence level and reduce the margin of error. The list of sample sizes and their confidence levels are shown in Table I.

Confidence Level	Sample Size
95%	385
80%	165
90%	271
97%	471
99%	664
99.9%	1083
99.99%	1513

Table 1: Sample Size (N) For Various Confidence Level

The following formula was used to compute the confidence levels:

$$n = [DEFF*Np(1-p)] / [(d2/Z21-\alpha/2*(N1) + p*(1-p)]$$

Where N represents the population size, p is the hypothesized percent frequency outcome factor in the population (50%+/-5), d is the confidence limit as a percentage of 100 (5%), and DEFF is the design effect.

This yielded the confidence levels for our sample size in Table I. We aimed to get at least 385 respondents to reach a 95% level of confidence. Ultimately, the researchers garnered a total of 486 survey responses. However, 47 responses were removed because they did not fit the population criteria. Therefore, only 439 out of 486 responses were used, analyzed, and interpreted in this study.

Since the study utilized a simple random sampling framework and not a multistage sampling framework, there was no need to distribute the sample throughout the different barangays in Davao city. The sample size provided by the OpenEpi software gave us a reliable enough number for the sample size needed for simple random sampling.

C. Data collection

Data collection began in February 2021 and lasted until March 2021. The researchers virtually collected information through an adapted, cross-sectional survey questionnaire by Sah *et al*. (2018) via Google Forms. The link to the questionnaire was posted through various social media platforms for the participants to have access. Before the participants could answer, an informed consent form along with a certificate of consent was presented to protect and assure the respondents' privacy for proper and legal data collection following the Philippine Data Privacy Act of 2012. The respondents had the freedom to answer anytime as soon as the link was posted. However, the online form remained available for only a month. Submissions beyond that time were no longer accepted. Moreover, the online survey form was disabled after a number of participants had completed the online questionnaire.

D. Instrumentation

This study utilized a self-administered online survey questionnaire adapted from a similar study by Sah *et al.* (2018) from the European Journal of Pharmaceutical and Medical Research[9]. The 33-item questionnaire evaluated three (3) consumers' demographic variables: age, gender, and monthly family income, their awareness of online pharmacies, and four (4) variables related to their views: acceptance, safety, practicability, and advantages to the community, particularly during the COVID-19 pandemic. Value-added services were also added to determine the specific services that the customers wish to see in an online pharmacy.

The questionnaire was distributed among the variables of our study: socio-demographic profile (3 items), awareness (4 items), acceptance (5 items), practicability (5 items), safety (5 items), advantages during the pandemic (3 items), and value-added services (8 items). The survey was pre-tested using Cronbach's alpha test to determine the study's reliability. Three (3) pharmacy professionals also validated the instrument to check if the survey was appropriate. The survey can be finished within five (5) to ten (10) minutes.

E. Data analysis

The collected data was encoded in Google Sheets and was analyzed by a statistician. Descriptive statistics, particularly frequencies and percentages, were utilized to reflect the respondents' socio-demographic profile. This was also used to determine the awareness of respondents regarding online pharmacies and the customers' views of online pharmacies.

Inferential statistics, specifically binary logistic regression analysis, was used to determine if the respondents' demographic profile had a significant relationship with their

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awareness and views regarding online pharmacies. In extracting insight from the analyzed data, a diagnostic analysis was utilized.

By using the number of responses as the qualitative data needed in using the binary logistic regression analysis, each variable was correlated with each of the dependent variables to come up with p-values with which to prove significant relationships or the lack of it.

F. Ethical considerations

The study was reviewed and approved last July 2021 by the San Pedro College Review Ethics Committee (SPC-REC) prior to its implementation, under the REC-Protocol number 2021-0097.

III. RESULTS

This chapter presents the study's comprehensive data in detail, which aimed to determine the customers' awareness and views of online pharmacies as a tool for continued service to the public despite various interruptions to public service brought by the COVID-19 pandemic. The results are presented in tabular form (Table II) to assess if the demographics of the respondents influenced the awareness and views of customers regarding online pharmacies.

Parameters	Segmentation	Frequency	Percentage (%)
Age	18-29	387	88.16%
	30-49	42	9.57%
	50-60	10	2.28%
Gender	Female	288	65.60%
	Male	143	32.57%
	Prefer not to say	8	1.83%
Monthly family income	Less than 12,000	74	16.86%
	12,001-24,000	84	19.13%
	24,001-47,000	101	23.01%
	47,001-82,000	98	22.32%
	82,001 and above	82	18.68%

Table 2: Socio-Demographic Profile Of Survey Respondents

The socio-demographic characteristics of the respondents are presented in Table II. A total of 439 participants responded. The age distribution was made of the following: 18-29 (88.16%); 30-49 (9.57%); and people aged 50-60 (2.28%).

For the gender distribution, 288 of the respondents were female (65.60%), while 143 reported being male (32.57%). The remaining eight respondents preferred not to label their gender (1.83%). Most respondents had an average monthly family income of Php24,001 – 47,00 (23.01%), followed by Php47,001-82,000 (22.32%). However, the gap in monthly income ranges was not too distant as 19.13%, and 18.68% of the respondents reported having an average monthly family income of Php12,001-24,000 and Php82,001 above, respectively. The cohort with the least respondents had a monthly income of fewer than 12,000 pesos (16.86%).

Parameters	No		Yes	
	N	*%*	*N*	*%*
Awareness on Online Pharmacy	147	33.49	292	66.51
Level of Utilization on Online Pharmacy	387	88.16	52	11.84
Awareness of Online Pharmacies operating in Davao City	245	55.81	194	44.19

Table 3: Respondents' Awareness Of Online Pharmacies

As presented in Table III, 292 out of 439 (66.51%) of the respondents were aware that medications could be obtained online. In comparison, only 52 (11.84%) used the internet to purchase medication, even if 194 (44.19%) were aware that online pharmacies are currently operating in Davao City. Online pharmacies offer the services that they were primarily aware of, that is, the ability to order products online (82.7%), followed by doorstep delivery (59.9%), pick-up services (56.9%), and online counseling (39.9%).

A. Customer Acceptability	**No**		**Yes**	
	N	*%*	*N*	*%*
Would you purchase medicine and other health products from an online pharmacy?	59	13.4	380	86.5
Are you willing to pay extra for delivery fees for medicine and other health products?	69	15.7	370	84.3
Would you order your medicine online then pick them up later in the pharmacy?	80	18.2	359	81.7
Would you want to receive online counselling on medicine from a pharmacist?	50	11.4	389	88.6
Do you recommend the services of online pharmacies in Davao City?	26	5.9	413	94.0
B. Practicability of Online Pharmacies	*N*	*%*	*N*	*%*
Are the services offered by online pharmacies helpful in your everyday life?	41	9.3	398	90.4
Is it easier for you to choose medicines, supplements, and cosmetics in an online pharmacy?	93	21.2	346	78.8

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Do you agree that doorstep delivery of medicines can help you save time?	28	6.4	411	93.6
Do you agree that ordering your medicines ahead will help you save time when picking them up later?	60	13.7	379	86.3
Is online counselling from a pharmacist convenient for you?	142	32.3	297	67.6
C. Safety of Online Pharmacies	***N***	***%***	***N***	***%***
Do you think online pharmacies are safe in general?	49	11.2	390	88.8
Are you concerned about fake health products in an online pharmacy?	23	5.2	416	94.7
Are you concerned with receiving the wrong item from an online pharmacy?	111	25.3	328	74.7
Are you concerned with your privacy in dealing with an online pharmacy?	111	25.3	327	74.5
Are you in favor of uploading your prescriptions to online pharmacies if needed?	116	26.4	323	73.5
C. Advantages of Online Pharmacies	***N***	***%***	***N***	***%***
Do you think online pharmacies have less risk of customers contracting the COVID 19 virus	23	5.2	4.16	94.7
Do you think online pharmacies will help lower the number of COVID 19 cases?	59	13.4	380	86.5
Are online pharmacies helpful for people in home quarantine?	3	0.70	436	99.3

Table 4: Respondent's Views Of Online Pharmacies

Table IV shows the views of respondents on online pharmacies currently operating in Davao City. Regarding their acceptance of online pharmacies, all questions were met with an overwhelmingly positive response as the respondents would purchase from an online pharmacy (86.5%%). The respondents were also willing to pay extra for the delivery fee (84.3%), order online (81.7%), and receive counseling online (88.6%). Nearly all of the respondents in Davao City would also recommend this type of service (94.0%).

The participants' views on the practicability of online pharmacies were also mostly positive. A majority of the respondents agreed that the services offered by online pharmacies would be helpful in their everyday lives (90.4%), with most of them saying that the most beneficial of aforementioned services would be the ability to order online (91.3%), followed by doorstep delivery (72.7%), online counseling (54.4%), and pick-up services (50.1%). Most participants also found that it was easier to choose from a comprehensive catalog of medicines, supplements, and cosmetics online (78.8%). When it came to time management, nearly all respondents agreed that doorstep delivery (93.6%) and pick-up services (86.3%%) would help them save time. Although most participants agreed, fewer participants found that receiving online counseling would be convenient (67.6%).

Despite the positive responses on the acceptance and practicability of online pharmacies, the respondents also expressed considerable concern regarding their safety. Although most respondents believed that online pharmacies are safe in general (88.8%), most of them were concerned about fake products (94.7%), receiving the wrong item (74.7%), and their privacy (74.5%) when dealing with an online pharmacy. However, most respondents were still willing to upload their prescriptions online if needed (73.5%).

When it came to its advantages during the COVID-19 pandemic, almost all respondents believed that online pharmacies lessened the risks of customers contracting the virus (94.7%). They also believed that online pharmacies could help lower COVID-19 cases (86.5%) in the city as it eliminates the need to have face-to-face interactions. Almost all of the respondents believed that the services provided by online pharmacies would be helpful to people in quarantine (99.3%).

Value-added Services	**N**	**Percentage (%) Distribution**
Doorstep Delivery	365	365 (83.14)
Pick-up Services	264	264 (60.14)
Availability of Service at any time	424	424 (96.58)
Patient Counselling	342	342 (77.90)
Patient Monitoring in Drug Therapy	361	361 (82.32)
Online Pharmacy App	412	412 (93.85)
Customer Support	362	362 (82.46)

Table 5: Respondent's Views Of Online Pharmacies

Table V shows that online pharmacies must ensure that doorstep delivery, pick-up services, patient counseling, patient monitoring, and customer support must be reinforced as part of value-added services to this program. Of all the value-added services, the most requested that the respondents wished to have in an online pharmacy was the availability of their service at any time (96.58%), followed by a mobile phone application (93.58%), doorstep delivery (83.14%), customer support (82.46%), patient monitoring on drug therapy (82.32%), patient counseling (77.9%), and finally pick-up services (60.14%). In patient counseling, the respondents mostly wanted to discuss the side effects of the

drugs (90.7%), proper dosage (85.4%), and drug interactions (75.2%) with the pharmacist.

Variables		p-value	Remarks
Awareness	*Gender*	0.210	Not significant
	Age	**0.002***	Significant
	Income	**0.021***	Significant
Acceptability	*Gender*	0.970	Not significant
	Age	0.588	Not significant
	Income	**0.004***	Significant
Safety	*Gender*	0.725	Not significant
	Age	0.293	Not significant
	Income	**0.013***	Significant
Practicability	*Gender*	0.721	Not significant
	Age	0.241	Not significant
	Income	0.762	Not significant
Advantages	*Gender*	0.502	Not significant
	Age	0.491	Not significant
	Income	0.153	Not significant

Table 6: Association Of Demographic Profile With Awareness And Views Of Online Pharmacies

* *Significant relationship at p <0.05*

Statistical analysis revealed an existing significant relationship between age and average monthly income with awareness of online pharmacy services.

Further analysis indicates there is a positive correlation between awareness and the age of the respondent, i.e. the older the respondent, the more aware they are of online pharmacies. There was a significant increase of 61.63% in awareness from ages 18-29 (41.09%) to 30-49 (66.67%), with the results conveniently placing the age group of 50-60 as the most aware of online pharmacies.

The average monthly income of the respondent influenced the respondent's awareness of online pharmacies. The income group of Php12,001-24,000 were the most aware, while those with incomes of less than Php12,000 were the least aware. Income also had a significant influence on the perceived acceptability and safety of online pharmacies, with both having a positive correlation with the respondent's income i.e. the higher the respondent's income, the safer and more acceptable their view of online pharmacies becomes.

- First, despite the varying income groups, all of them had an acceptance of online pharmacies not being less than 90%. Of the population, it was found that those with incomes of Php24,001-47,000 were the least accepting of it (91.09%), while those with incomes of Php82,001 and above had the highest acceptance of online pharmacies (98.78%). Second, in terms of perceived safety, the researchers found that only 58.54% of those with incomes of less than Php12,000 viewed it as safe while 81.82% of those with incomes of Php82,001 and above consider it safe. Other demographic variables suggest no significant relationship with the awareness and views of the respondents regarding online pharmacies.

IV. DISCUSSIONS

The survey results indicate that most of the respondents were 18-29 years old (88.16%). The distribution of females (288/439, 65.60%) and males (143/439, 32.57%) signifies that females outweighed male respondents in this survey. Meanwhile, the average monthly income groups of Php24,001 - Php47,000 (23.01%) and Php47,001 - Php82,000 (22.32%) were nearly equal, indicating that most of the respondents for this survey belong to the middle-class group, with those from the lowest-income group and low-income group accounting for 16.86% and 19.13% respectively.

It was found that 292 out of 439 (66.51%) of the respondents were aware that medications could be obtained online. In comparison, only 52 (11.84%) used the internet to purchase medication, even if 194 (44.19%) were aware that online pharmacies are currently operating in Davao City. This number is likely to increase in the future as more respondents become aware of the availability of online pharmacies in Davao City. The level of online pharmacy utilization among respondents may be low as most of them are not confident enough in the reliability of current services to purchase maintenance medication online.

The lack of awareness in Davao City is similar to the result presented by Ndem, E. *et al.* (2019) regarding consumers' awareness in Nigeria. In their study, only less than a third of the respondents (28%) were aware of the availability of online pharmacies[2], which is close to the 44.19% awareness from the respondents in Davao. Similarly, Khurshid F. *et al.* (2015) reported that the majority of their respondents from Saudi Arabia have not heard of online pharmacies and very few respondents purchased medicinal products through online pharmacies[10]. Moreover, respondent utilization rates from both studies, Ndem, E. *et al.* (2019) at 3% and Khurshid F. *et al.* (2015) 31.2%, are comparable to this study's respondents' utilization rate of 11.84%. The majority of those who dissented in the study conducted in Nigeria reported concerns with substandard and counterfeit medicines (68%), illegal websites and internet security (94%), non-availability of brands prescribed by the physician (55%), and chances of ordering wrong medicines (60%). Uncertainty about the timely delivery of medicines was also reported as a concern.

The results indicate the need for a standardized approach to service provision as well as a regulatory framework that will help improve consumer confidence and awareness. For example, there are regulations in the USA that certify online pharmacies. This includes the Verified Internet Pharmacy Practice Sites (VIPPS) program of the

National Boards of Pharmacy and the BeSafeRx campaign of the US Food & Drug Administration[11-12]. The former assures that online pharmacies meet the country's standards of pharmaceutical practice. At the same time, the latter is a database that can be assessed to confirm the authenticity of an online pharmacy registered in the USA. In a similar certification program introduced in the United Kingdom by the Royal Pharmaceutical Society of Great Britain, certified online pharmacies display a logo on their websites to assure the quality of their services[13]. Even though online pharmacies exist in Nigeria, information on whether these meet the pharmacy practice standards of the country and overall regulation is currently lacking. In line with this, there is also an urgent need to provide a formal regulatory framework in the Philippines.

Regarding acceptability, it was clear that most of the respondents answered in the affirmative. This could mean that respondents were generally accepting of the services offered by online pharmacies. The result is consistent with Asdaq's (2016) findings, which found that residents of Riyadh had a positive perception of the acceptability of online pharmacy services, online purchasing of other products, and had an overall high acceptance[14]. The generally positive reception of online pharmacies in our survey could be influenced by the pandemic, as people try to find ways to continue receiving healthcare while minimizing contagion exposure.

In terms of practicability, a lesser percentage of respondents (67.6%) thought online counseling was convenient — even though they found online pharmacies helpful in delivering medicines to homes (93.6%) and that ordering online would save time (86.3%). Convenience-related factors, such as the ability to order medications 24 hours a day (59%), time savings (50%), and fewer trips to the pharmacy (41%), were the most frequently cited reasons by interviewees for buying or intending to buy online, according to a study conducted by Khurshid, F. *et al.* (2015)[10]. Furthermore, Asdaq (2016) discovered that for respondents, reducing retail pharmacy trips was more practical than receiving counseling for each drug they paid for[14].

In terms of safety, most of the respondents were concerned about transmitting their data online, especially regarding their privacy and receiving wrong or fake items from online pharmacies. This might be why only 11.84% of the respondents were utilizing the services of online pharmacies (see Table 2). Concerns regarding the privacy of the consumers surfaced as a barrier along with security. A study by Kuzma (2011) on the security vulnerabilities of 60 online pharmacy sites showed that most sites (80%) had either critical or medium-level vulnerabilities, which could pose grave problems to online consumers who use the sites[15]. Due to lack of consumer trust and inadequate cybersecurity measures, consumer adoption of online pharmacy services may be hindered and even retrogress.

Concerns of receiving wrong or fake items or medicines from an online pharmacy may be due to the ubiquity of counterfeit or fake medicines in low- and middle-income countries. Ozawa *et al.* (2018) estimate that the prevalence of substandard and falsified medicines in low- and middle-income countries was 13.6%. Moreover, the highest prevalence of falsified and substandard medicines was registered in Africa (18.7%) and Asia (13.7%)[16]. These counterfeit drugs may be due to fake online pharmacies, which sell substandard and fake drugs, and use their website to obtain personal and financial information from consumers. Furthermore, the National Association of Boards of Pharmacy identified that nearly 95% of websites offering prescription-only drugs online operate illegally, and 89% of illegal online pharmacies reviewed by NABP did not require a prescription for the sale of prescription-only medicine[17].

In terms of the advantages brought by online pharmacies, the majority of the respondents replied in the affirmative that online transactions might reduce the risk of customers contracting COVID-19 and that this program would be helpful to people under quarantine. Thus, 86.5% think that online pharmacies might help lower the number of COVID-19 cases. The pandemic shifted the purchasing behavior of consumers to alternative independent and online channels. It elevated the demand for COVID-19 related products such as facemasks, vitamins, and rubbing alcohol and increased order placements through phone and online platforms. In relation to the results, the respondents of this research understood the limited options of getting medications and other items available in pharmacies during the COVID-19 pandemic, especially for people under quarantine. In the study of Liu *et al.* (2020), one of the pharmacy responses to combat the coronavirus epidemic in China is to establish remote pharmacy services such as online drug prescribing, drug consultation, and drug delivery services to reduce human to human infections[18]. This supports respondents' belief that online pharmacies may lower the number of COVID-19 cases.

The four investigated variables revealed that the safety of transacting online (in terms of receiving counterfeit medicines and data privacy) was the primary cause of concern among the respondents. On this note, community and hospital pharmacists must ensure that the current system guarantees that the privacy of their patients can be effectively protected. They must also coordinate with their courier service to ensure that dispensed medication for transport is thoroughly checked to ensure that counterfeit medicines and other untoward circumstances are prevented. This reinforces the trust and confidence of the general public in the kind of service online pharmacies are offering.

In addition, of the seven value-added services the respondents want in an online pharmacy, availability of services at any time (online) and an online pharmacy app received the highest percentage of approval among the respondents at 96.58% and 93.85%, respectively. Notably, with regards to the value-added service of patient counseling, the respondents wanted to discuss with the pharmacist the possible side effects of the drugs (90.7%), proper dosage (85.4%), and drug interactions (75.2%).

The preference for the availability of services at any time and the development of an online pharmacy app may be due to the fact that most of the respondents who answered the

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survey were between the age of 18-29 years old. This assumption coincides with an article by Schumacher & Kent (2020) which states that younger people, especially from wealthy families, are frequent internet users, especially during the COVID-19 pandemic[19]. Furthermore, a study by a pharmacy chain in the USA showed that patients felt that a pharmacist-driven app was beneficial due to the accessibility and portability of health and drug information. Patients also liked having counseling points for each medication, the ability to receive videos on medication administration, the ability to refill prescriptions, reminder alarms, the ability to record doses, and the ability to view statistics and graphs to track adherence[20].

To ascertain the effectiveness of value-added services, several parameters must be looked into to address some of the issues surrounding online pharmacies, which can be explored in the future. However, as online pharmacies are not yet well established in Davao City, the current findings prove that online pharmacies, if well established, are acceptable to the general public.

Results of the statistical analysis revealed that age and income, among all variables, were significantly associated with online pharmacy awareness with p-values of 0.002 and 0.021, respectively. Hence, the respondents' awareness of online pharmacies is significantly influenced by their age and monthly income. Meanwhile, respondents' views on the acceptability and safety of online pharmacy services are significantly influenced by their average monthly income, with a p-value of 0.004 for acceptability and a p-value of 0.013 for safety. The majority of the respondents were concerned about the privacy of the data transmitted to the pharmacy store and the quality of the medicines delivered by the program, which could explain the responses.

The presented data coincides with other related literature, such as the findings of Fittler e*t al.* (2018), in which age has been connected to online buying and in online markets[21]. Furthermore, according to The Alliance for Safe Online Pharmacies (2017), consumers aged 55 and up were already familiar with the concept of online pharmacies[22]. The respondents' income was significantly related to their awareness and views. This supports Desai's claim that one of the enabling factors for buying medications online is income[23]. Also, according to The Alliance for Safe Online Pharmacies, higher-income respondents considered online pharmacies safe[22].

The significant increase in awareness observed from the respondents aged 30-49 highlights that they are from Generation X, who have made the most purchases online in recent years[24]. The respondents' life, income, and presence of chronic health conditions could be factors in online activity, online pharmacy services included. Following this, a study by Fittler e*t al.* (2018) indicates a positive correlation between the presence of chronic health conditions and the age of the respondent[21], which would also be in line with the results of our study indicating that the oldest (aged 50-60) are the most aware of online pharmacies, since in the cited study, the findings indicate that the greater the age of the respondent, the more prevalent chronic health conditions are.

As the groups of people aged 30-49 and 50-60 are more aware of online pharmacies, and as they are also the ones who view it as safer, further studies could look into the relationship between the population's utilization/awareness and perception of safety. Infographics and information drives must be reinforced to ensure that the majority of the respondents, regardless of age and income, are aware of the current online pharmacy services offered at this time.

On the other hand, there was no significant relationship between demographics and the practicability and advantages provided by the programs of online pharmacies. Despite disparities in the demographics, most respondents find online pharmacies suitable during this pandemic.

V. CONCLUSION

This study provided an overview of the customers' awareness and views of online pharmacies in Davao City during the COVID-19 pandemic. Regarding their views, the researchers wanted to learn about the respondents' perceived acceptance, practicability, safety, and advantages of online pharmacies during the pandemic and also the value-added services that they wish to implement on the said service.

The current study found that the residents of Davao City were unaware that online pharmacies existed in their city despite knowing of it conceptually; thus, obtaining medicines from online pharmacies was not a regular practice. Furthermore, the acceptability and feasibility of this model received positive responses from respondents, despite safety concerns. Thus, the majority of respondents said that they wished to use an online pharmacy and with its value-added services.

The respondents' positive reaction indicates a demand for this type of platform; yet, its utilization is restricted due to a lack of public information on outlets available within the city. In addition, the researchers presumed that consumers were not fully informed or educated about the fact that this platform is available in their area for them to utilize. Consumers will not be oblivious to online pharmacies if public awareness was raised and will have various options to choose from that will not compromise their safety.

For all of the data, we found that two of the demographic variables (Age and Income) have a significant relationship with the respondents' awareness. With one of the demographic variables, Income having a significant relationship with the respondents' view on the safety of online pharmacies. For the rest of the demographic variables in each table, the researchers found that there is no significant relationship between the demographic profile and the variables because regardless of the differences of the respondents, their view or awareness of a particular variable is similar.

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VI. RECOMMENDATIONS

The results of this study can help bridge the knowledge gap of customers regarding online pharmacy by identifying their awareness and the factors that affect their views. The researchers would like to suggest a study on improving the understanding of online pharmacies, as it was discovered that there is a knowledge gap on this platform. Further research on various communities in the Philippines regarding online pharmacies should also be conducted as the results of our study are limited to the residents of Davao City. The researchers would also like to recommend using a different sampling technique such as stratified random sampling or multi-stage sampling, which would better represent the whole population of Davao City. Additionally, these findings may inform prospective investors about how and where to allocate their resources in building an online pharmacy. The researchers would recommend future business investors to first examine the level of awareness in their target market, as consumer awareness will influence the utilization of the service. Furthermore, investors may use the data from this study's survey to reference how to implement online pharmacies so that the platform can properly serve its consumers based on their awareness, views, and value-added services that they wish to be available. Increased public awareness efforts and advertisements from local health authorities are needed to improve the lack of awareness and concern of its safety to prevent limiting patient treatment alternatives, particularly in the current pandemic.

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REFERENCES

[1.] Fung C, Woo H, Asch S. Controversies and Legal Issues of Prescribing and Dispensing Medications Using the Internet. Mayo Clinic Proceedings. 2004;79(2):188-194.

[2.] Ndem E E, Udoh A, Awofisayo O, Bafor E. Consumer and Community Pharmacists' Perceptions of Online Pharmacy Services in Uyo Metropolis, Nigeria. 2019. ResearchGate. 10.24926/iip.v10i3.1774

[3.] COVID-19 has changed online shopping forever, survey shows [Internet]. UNCTAD. 2020 [cited 11 May 2022]. Available from: https://unctad.org/news/covid-19-has-changed-online-shopping-forever-survey-shows

[4.] Sangani P. CitiusTech expects Covid-19 impact to boost business in FY22 [Internet]. The Economic Times. 2020 [cited 28 December 2020]. Available from: https://economictimes.indiatimes.com/tech/startups/citiustech-expects-covid-19- impact-to-boost-business-in-fy22/articleshow/80025646.cms

[5.] Goyal A, Singh N K, Zanjurne A. In The Spotlight: e-Pharmacy in India | An Exponential Growth Opporunity. Frost & Sullivan. 2020.

[6.] Global Mail Order Pharmacy Market 2020-2027 - COVID-19 Impact and Analysis by Drug Type, Product, Mode of Order, and Geography - ResearchAndMarkets.com [Internet]. Business Wire. 2020 [cited 2020Dec11]. Available from: https://www.businesswire.com/news/home/20201102005554/en/Global-MailOrder-Pharmacy-Market-2020-2027---COVID-19-Impact-and-Analysis-by-DrugType-Product-Mode-of-Order-and-Geography---ResearchAndMarkets.com

[7.] González Peña O I, Lopez Zavala M A, Ruelas H C. Pharmaceuticals Market, Consumption Trends and DiseaseIncidence Are Not Driving the Pharmaceutical Research on Water and Wastewater. 2020. Int. J. Environ. Res. Public Health 2021. 18: 2532

[8.] Bellman S, Lohse G, Johnson E. Predictors of online buying behavior. Communications of the ACM. 1999;42(12):32-38

[9.] Sah RK, Changande RD, Suranagi U, Manocha S, Kapur A and Hotha P. Awareness and Behavioural Outlook Towards Online Pharmacy Services Among Consumers in Delhi, India: A Pilot Survey. EJPMR 2018; 5(3), 552-557

[10.] Khurshid F, Alfahad N F, Albelali M T, Al-Arifi M N. Perception and Knowledge to Online Pharmacy Services among Consumers in Riyadh, Saudi Arabia: a Pilot Survey. Latin American Journal of Pharmacy. 2015. 34(6):1113-111

[11.] Digital Pharmacy Accreditation | National Association of Boards of Pharmacy [Internet]. National Association of Boards of Pharmacy. 2020 [cited 11 May 2022]. Available from: https://nabp.pharmacy/programs/accreditations-inspections/digital-pharmacy/

[12.] BeSafeRx [Internet]. U.S. Food and Drug Administration. 2020 [cited 11 May 2022]. Available from: https://www.fda.gov/drugs/quick-tips-buying-medicines-over-internet/besaferx-your-source-online-pharmacy-information

[13.] General Pharmaceutical Council. Guidance for registered pharmacies providing pharmacy services at a distance, including on the internet [Internet]. General Pharmaceutical Council; 2019. Available from: https://www.pharmacyregulation.org/sites/default/files/document/guidance_for_registered_pharmacies_providing_pharmacy_services_at_a_distance_including_on_the_internet_april_2019.pdf

[14.] Asdaq S M B, Al Laham S N, Alshammary M F, Alharbi R F, Alfagih S A. A Cross Sectional Study On Awareness And Acceptability Of Online Pharmacy Services Among internet Users Of Riyadh, Saudi Arabia. World Journal Of Pharmacy And Pharmaceutical Sciences. 2016. 12: 257-266.

[15.] Kuzma J. Web vulnerability study of online pharmacy sites. Informatics for Health and Social Care. 2011;36(1):20-34.

[16.] Ozawa S, Evans DR, Bessias S, Haynie DG, Yemeke TT, Laing SK, et al. Prevalence and estimated economic burden of substandard and falsified medicines in low- and middle-income countries: A systematic review and meta-analysis. JAMA Netw Open. 2018;1(4):e181662.

[17.] The National Association of Boards of Pharmacy. Internet Drug Outlet Identification Program Progress Report: September 2018. 2018.

[18.] Liu S, Luo P, Tang M, Hu Q, Polidoro JP, Sun S, et al. Providing pharmacy services during the coronavirus pandemic. Int J Clin Pharm. 2020 Mar 28;42(2):299–304.
[19.] Schumacher S, Kent N. 8 charts on internet use around the world as countries grapple with COVID-19. Pew Research Center. Retrieved June 9 2021 from https://www.pewresearch.org/fact-tank/2020/04/02/8-charts-on-internet-use-around-the-world-as-countries-grapple-with-covid-19/
[20.] DiDonato K, Liu Y, Lindsey C, Hartwig D, Stoner S. Community pharmacy patient perceptions of a pharmacy-initiated mobile technology app to improve adherence. International Journal of Pharmacy Practice. 2015;23(5):309-319.
[21.] Fittler A, Vida R G, Kaplar M, Botz L. Consumers Turning to the Internet Pharmacy Market: Cross-Sectional Study on the Frequency and Attitudes of Hungarian Patients Purchasing Medications Online. Med Internet Res. 2018. 10.2196/11115
[22.] Online Pharmacy Consumer Behavior and Perception Survey [Internet]. buysaferx.pharmacy. [cited 2020Dec11]. Available from: https://buysaferx.pharmacy/public-awareness-campaigns/drugimportation/factsheets/online-pharmacy-consumer-behavior-and-perceptionsurvey/
[23.] Desai C. Online pharmacies: A boon or bane?. Indian Journal of Pharmacology. 2016;48(6):615.
[24.] The truth about online consumers [Internet]. assets.kpmg. 2017 [cited 8 June 2021]. Available from: https://assets.kpmg/content/dam/kpmg/xx/pdf/2017/01/thetruth-about-online-consumers.pdf