

Perceived medication-related problems through non-contact acquisition of medicine in the new normal

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ABSTRACT

The strict lockdowns due to COVID-19 pandemic, stimulated the transition of pharmacy services to online non-contact acquisition modality. The study aimed to determine perceived medication-related problems (MRPs) by non-contact acquirers in the new normal and propose relevant intervention programs. Mixed-methods design, particularly sequential-exploratory and practical action research was employed. Respondents were administered with a modified screening tool for perceived MRPs and were interviewed to determine their relevant experiences. Non-contact acquirers perceived MRPs, namely, drug ineffectiveness, adverse drug effects, overdosage, inappropriate treatment, non-adherence and drug-interaction as low risk. Non-contact acquisition in the new normal was perceived significantly as lower risk for MRPs, than in-person acquisition before pandemic. Convenience, security, customer care and effectiveness of medicines were the advantages of the modality, while shipping problems, dispensing errors, and fake online pharmacies were the shortcomings. Intervention programs such as drug information webinars and infographics on MRPs are recommended to safeguard the patient's health.

Key words: medication-related problems, new normal, non-contact acquisition

1. Introduction

A surge in the use of digital technologies in the recent years have been attributed to the COVID-19 pandemic (De' et al., 2020). With the easy accessibility to the internet, individual practices in terms of communication and procurement processes have changed rapidly. The fact that billions of people have access to the internet, online users became a target market to various institutions including the provision of health services. The fact that billions of people have access to the internet, online users became a target market to various institutions including the provision of health services (Budd et al., 2020). One of the most essential online services that the COVID-19 highlighted are online pharmacies.

In the Philippines, an online pharmacy as defined by Republic Act 10918 known as Philippine Pharmacy Act, refers to "a pharmaceutical services of a duly licensed pharmaceutical outlet done over the internet". Guidelines are in place ensuring that online pharmacies sell and dispense medications under the supervision of a registered pharmacies (FDA Philippines, 2022). During pandemics, online

pharmacy is a vital platform wherein consumers or the non-contact acquirers can purchase medicines without visiting the pharmacy outlet physically, limiting spread and exposure to viruses. Here in the study, we define non-contact acquisition as the process of medication purchase in an online pharmacy through their web portal, electronic mail, telephone call, or short message service. Upon purchase, the medication is delivered or shipped to the non-contact acquirer.

It has been noted that non-contact acquisition provides many benefits to the consumers such as convenience, accessibility, fast and inexpensive mode of medicine procurement, and provision of a platform where drugs can be compared easily (Fittler et al., 2018). However, the online process also entails risks to the health of consumers. The lack of physical contact and communication with a pharmacists may predispose patients to medication abuse, self-diagnosis, and inappropriate medication use (Jairoun et al., 2021). The absence of medication counseling in the dispensing process can be a starting point for a medication-related problem (MRP) to arise which may worsen the patient's condition. Events involving therapeutics that may lessen the desired outcome of the patient's medical care are known as MRPs

Table 1. Indicator statements used for each MRP in the screening tool.

MRP	Indicator statements
Drug Ineffectiveness	1. My medication during online/ offline acquisition of medicines and professional pharmacy services, does not seem to help that much. 2. My medication does not help improve my condition during online/ offline acquisition of medicines and professional pharmacy services.
Adverse Drug Effects	3. During online/ offline acquisition of medicines and professional pharmacy services, sometimes my medication has effects I do not like
Overdosage	4. During online/ offline acquisition of medicines and professional pharmacy services, sometimes I think I take too many medications.
Inappropriate Treatment	5. During online/ offline acquisition of medicines and professional pharmacy services, sometimes I feel worse after I take my medication. 6. During online/ offline acquisition of medicines and professional pharmacy services, sometimes I think I may not be taking the right medication for my condition.
Non-adherence	7. During online/ offline acquisition of medicines and professional pharmacy services, I have trouble taking my medication the way I am supposed to. 8. My medication interferes with my routine during online/ offline acquisition of medicines and professional pharmacy services.
Drug Interactions	9. During online/ offline acquisition of medicines and professional pharmacy services, I worry about drug interactions between the medications I take.

(Al-Azzam et al., 2016). These include drug ineffectiveness, adverse drug effects, overdosage, underdosing, inappropriate treatment, inadequate monitoring, non-adherence and drug-interaction (Ruscin and Linnebur, 2021). It is important to note that majority of MRPs are avoidable, hence, interventions must be in place to safeguard the health or patients. To prevent MRPs, the initial step is to first identify them. To meet this end, the present study aimed to determine the perceived MRPs by non-contact acquirers in the new normal and propose suitable interventions to address them. The study is important as it helps non-contact acquirers achieve the goals of drug therapy given the MRPs, and at the same time reinforce the crucial role of pharmacists in providing the best possible outcome of pharmacotherapy in the dispensing process.

2. Methodology

2.1. Research Design and Selection of Participants

The study was approved for implementation by the University of Makati – University Research Center following an ethical guideline for the conduct of research. An exploratory sequential mixed method design (Castro et al., 2010; Edmonds et al., 2017) and a practical action research design (Masters, 1995) were used in the study. Non-probability sampling, specifically, purposive and convenience sampling were used. Participants were considered eligible to be part of the study if they were 18 years old or above, residing in the National Capital Region (NCR), Philippines, willing to take part in a research and have an experience purchasing medicines through non-contact acquisition during the pandemic.

2.2. Research Instrument

The study used a brief screening tool for MRPs adapted

from Kernodle et al. (2017). The tool was modified and underwent validation and reliability testing to make the tool comprehensive and relevant in the context of non-contact acquisition process. The screening tool for MRP included questions about socio-demographics and dealt with statements pertaining to drug ineffectiveness, adverse drug effects, overdosage, inappropriate treatment, non-adherence and drug interaction. The nine-item brief screening tool was a reverse 4-point Likert scale wherein 1, 2, 3 and 4 indicates strong agreement, agreement, disagreement and strong disagreement, respectively. The list of indicator statements per MRP is summarized in Table 1. The ratings were interpreted by getting the mean ratings of respondents. Testing of the tool was performed on 25 individuals who share the same characteristics as the study respondents but did not participate in the actual study. Results were analyzed by Cronbach's alpha using SPSS version 25.

2.3. Data gathering

Data were gathered online. To minimize the inherent bias of non-probability samplings used, the research tool was made brief and easily accessible to the target population. An electronic poster of a call for participants was uploaded and circulated through the facebook pages of the University of Makati, its attached institutions, and the researchers as well. To widen the reach, the electronic poster was also shared through the messenger application. Respondents, upon giving consent, answered the questionnaire in the tool to primarily assess their perception on the risks of MRPs. Respondents who were identified to have high perceived risk of MRPs proceeded to individual interview about their experiences in non-contact acquisition using Zoom teleconferencing. Researchers stopped the conduct of the individual interview when the responses were already repetitive or similar.

Answered were then processed through thematic analysis. Data were analyzed using SPSS version 25 and JASP version 0.16.1. A p-value <0.05 was used to indicate significant difference.

3. Results

The modified screening tool was found to have a Cronbach's alpha of 0.855, which indicates that the modified tool was appropriately valuable for data gathering and analysis. A total of 118 individuals responded to the call, but only 61 were deemed eligible to participate. Participants were from Makati, Taguig, Paranaque, Pasig, Pasay, Malabon, Manila and Quezon City. The 61 respondents were involved in the quantitative phase of the study. From this count, 9 respondents were identified to have high perceived risk of MRP, however, only 4 accepted to be interviewed and proceeded to the qualitative phase of the study. Socio-demographic characteristics of the respondents is summarized in Table 2.

Both over-the-counter and prescription medicines were procured in non-contact acquisition (Table 3), which covered a wide class of medications from simple food supplements, vitamins and minerals to maintenance medications such as anti-hypertensive and anti-diabetic agents (Table 4). The respondent's mean level of agreement to MRP indicator statements were low indicating that drug ineffectiveness, adverse drug effects, overdosage, inappropriate treatment, non-adherence, and drug interaction pose a low risk for MRPs through non-contact acquisition process (Table 5). Medications commonly acquired by the respondents does not correlate with drug ineffectiveness and adverse drug effects. Meanwhile, overdosage, inappropriate treatment, non-adherence and drug interaction were found to have a weak positive correlation, although the relationship is not statistically significant as the p-values generated were higher than 0.05 (Table 6). When the respondents were grouped based on their socio-demographic profiles, the mean level of agreement along MRP indicators showed no significant difference for age, sex, and income, while educational attainment and marital status were observed to have significance (Table 7). Those who are single, living alone, with high educational attainment significantly perceived MRPs through non-contact acquisition as low risk. Notably, we found that perceived MRP is significantly lower in non-contact acquisition in the new normal than in-person acquisition before the pandemic. In the qualitative phase, the positive effects of non-contact acquisition where the presence of customer care, convenience, and health security. While shipping problems, dispensing errors, lack of professional advice and presence of fraudulent online pharmacy websites were identified to be the negative effects of non-contact acquisition process.

Table 2. Sociodemographic profile of participants.

Sociodemographic variables (n = 61)		n	%
Age	18–24	21	34.43
	25–29	8	13.12
	30–34	3	4.92
	35–39	4	6.56
	40–44	4	6.56
	45–49	8	13.12
	50–54	7	11.48
	55–59	1	1.64
	60–64	3	4.92
65 and older	2	3.28	
Sex at birth	Male	36	59.02
	Female	25	40.98
Marital Status	Single (Living Alone)	8	13.12
	Single (Living with Family/Friends)	31	50.82
	Married	22	36.07
Educational Attainment	Secondary	12	19.67
	Bachelor's Degree	23	37.71
	Master's Degree	17	27.87
	Doctorate Degree	8	13.12
	Post-doctorate Degree	1	1.64
Monthly Income During the Pandemic	Less than PHP 10,957	17	27.87
	PHP 10,957 – PHP 21,194	8	13.12
	PHP 21,195 – PHP 43,828	17	27.87
	PHP 43,829 – PHP 76,669	12	19.67
	PHP 76,670 – PHP 131,484	4	6.56
	PHP 131,489 – PHP 219,140	1	1.64
	Above PHP 219,140	2	3.28

Table 3. Types of medication purchased through non-contact acquisition process during the pandemic (n=61).

Classification	n	%
Over-the-Counter	25	40.98
Prescription	3	4.92
Both	33	54.10

Table 4. Medication classes commonly purchased through non-contact acquisition process during the pandemic.

Type of Medication	Class of Medication	n	%
Over-the-Counter	Vitamins and Minerals	74	29.48
	Cough and Cold Medicine	56	22.31
	Analgesics	49	19.52
	Antihistamine	33	13.15
	Anti-diarrhea	26	10.36
	Food Supplements	13	5.18
Prescription	Anti-hypertensive	19	27.14
	Anti-microbial	16	22.86
	Anti-diabetic	13	18.57
	Antihyperlipidemic	9	12.86
	Others	8	11.43
	Antigout	5	7.14

4. Discussion

Younger individuals were observed to be the frequent non-contact acquirers in the new normal. Since procurement was done online, our results corroborate with the fact that

Table 5. Summarized risk classification for the types of MRPs perceived by during and before the pandemic.

Type of MRP	During the Pandemic (Non-contact Acquisition)		Before the Pandemic (In-person Acquisition)	
	Mean ± SD	Risk Classification	Mean ± SD	Risk Classification
Drug interaction	2.41 ± 1.01	Low	2.48 ± 0.98	Low
Adverse Drug Effects	2.10 ± 0.94	Low	2.39 ± 0.97	Low
Overdosage	2.10 ± 0.93	Low	2.31 ± 0.99	Low
Inappropriate Treatment	2.09 ± 0.93	Low	2.18 ± 1.03	Low
Non-adherence	2.03 ± 0.94	Low	2.07 ± 1.03	Low
Drug Ineffectiveness	1.80 ± 0.79	Low	1.80 ± 0.82	Low
Grand Mean	2.09 ± 0.61	Low	2.21 ± 0.97	Low

Interpretation: 1.00 to 1.75 = Strongly Disagree/Not a Risk of MRP; 1.76 to 2.51 = Disagree/Low Risk; 2.52 to 3.27 = Agree/Moderate at Risk; 3.28 to 4.00 = Strongly Agree/Highly at Risk.

Table 6. Correlation between commonly acquired medications and mean level of agreement along MRP indicators.

Commonly acquired medications and:	r	p-value
Drug Ineffectiveness	0.032	0.808
Adverse Drug Effects	0.040	0.759
Overdosage	0.133	0.306
Inappropriate Treatment	0.100	0.611
Non-adherence	0.191	0.139
Drug Interaction	0.131	0.313

Interpretation: -1.00 perfect negative correlation; -0.60 strong negative correlation; -0.30 moderate negative correlation; -0.10 weak negative correlation; 0.00 no correlation; 0.10 weak positive correlation; 0.30 moderate positive correlation; 0.60 strong positive correlation; 1.00 perfect positive correlation.

Table 7. Significant differences in the mean level of agreement along MRP indicators when grouped to socio-demographic profile.

Socio-demographic Variables	F-value	p-value
Age	1.230	0.299
Sex at Birth	0.312	0.579
Marital Status	3.490	0.021
Educational Attainment	3.510	0.021
Monthly Income During the Pandemic	1.940	0.092

younger populations tend to adapt more quickly to the technological developments. Those who use the internet frequently are more likely to purchase medication online, and it has been identified that emerging adults in the age range of 18-29 years old access the internet more than any other age group (Pew Research Center, 2012). Individuals belonging to the newer generations are known to be “digital natives” since they were born and/or raised in an environment where digitalization is prominent. While the older population known as “digital immigrants” are those individuals exposed in an analogue environment most of their time and slowly

being exposed to digitalization (Prensky, 2001). In our study, there were low non-contact acquirers aged 55 and above, which may be attributed to their transitioning phase in the use of digital platforms. With regards to sex, males were more frequently the non-contact acquirers than females in the present study, although the difference is not statistically significant. Additionally, we report a low number of non-contact acquirers living alone. The frequency of purchasing online of an individual may be related and affected by the size of a particular household. We have observed that living with spouse, family or friends translates to a high frequency of non-contact acquisition practices. Medications purchased online were for personal and family/friend use. In addition, majority of non-contact acquirers have at least a Bachelor’s degree. Literacy on the use of online platform and the process of online procurement may have played a part in the distribution of non-contact acquirers with respect to educational attainment. Lastly, most of the respondent’s income during the pandemic was less than PHP 10,957. During this time, most work establishments have closed to minimize the spread of the virus. Due to this, a lot of individual running low on money turned to non-contact acquisition where it is attributed to be a cheaper mode of procurement.

In terms of the type of medications purchased, most respondents acquired both over-the-counter and prescription medications. According to Ozawa et al. (2022), online purchases of medicines increased as a result of pandemic, since a visit to a physical pharmacy poses a risk of contracting the virus and triggers its spread (Jairoun et al., 2021). Vitamins and minerals were the top over-the-counter medications purchase because strong immunity is a must and was regarded by healthcare professionals as one of the preventive measures against the virus. Because fever, tiredness rashes, diarrhea, cough and colds are the most common manifestations of COVID-19, medications to treat and manage these symptoms also got a lot of attention during the pandemic. These findings were similar to the results of

Jairoun et al. (2021), wherein typical medications related to COVID-19 were mostly purchased. For prescription medications, most of the respondents purchased prescription drugs for chronic conditions such as high blood pressure and diabetes. As people tend to be more cautious with their health during the pandemic, these maintenance medications were observed to be procured more often online for convenience.

For all the MRP indicator statements, respondents have implied disagreement which is interpreted as low risk for MRPs. The average mean of non-contact acquisition in the new normal is significantly lower than in-person acquisition before the pandemic. This indicates that respondents considered purchasing online to have a lower risk for MRPs than physical purchasing before pandemic. According to Long et al. (2022), medications bought online are likely to be more effective and helpful in improving and managing the patients' conditions. Schmittiel et al. (2013) added that patients are likely to adhere more to taking mail-ordered medication. This may be due to their personal effort in procuring their medications. Additionally, a weak correlation was found between the commonly-acquired medications and level of agreement along MRP indicators, namely overdosage, inappropriate treatment, non-adherence and drug interaction, while no correlation was observed on adverse drug effects and drug ineffectiveness.

During the interview, we have extracted both positive and negative effects of non-contact acquisition in the new normal. For the positive effects, customer care has been highlighted. Non-contact acquisition provides customer care, because services are organized and systematic; and respondents can easily understand the instructions on purchasing their medications. Singh et al. (2020) revealed that online pharmacy enhanced consumer information and exchange of information. As a result of customer care, our respondents felt being taken care of while interacting with the online pharmacy staff. However, the pharmacy staff is not necessarily a licensed pharmacist, thus, detailed information about the medicine is not readily available. An individual who purchases medicines online has the convenience of comparing drug prices, researching health products and their services such as stores offering a variety of medicines and those giving a 24/7 service. Chordiya and Garge (2018) also confirm that non-contact acquisition via an online pharmacy is simple, convenient and fast; individuals who live far from a physical pharmacy, elderly, disabled people, and those with a busy daily routine can all benefit from it. Furthermore, shipping fees are frequently less than the cost of travelling to a typical pharmacy. Finally, health security is a positive experience for the respondents. Buying medications online is hassle-free and safe since exposure to the virus is limited. According to Singh et al. (2020), during a pandemic, consumers buy everything online and pick home delivery for all essential items and medicines for their safety. There are however negative attributes of the non-contact acquisition

process. Shipping is one of the most commonly seen problem. In the interview, respondents said that it is difficult to ensure getting the purchase on time unless it is personally picked up from the physical pharmacy. Moreover, there are instances that the medications are not in good packaging that may compromise its desired effect. Respondents also experienced dispensing errors, wherein wrong medications were delivered and returns have been complicated. These findings were supported by the study of Jairoun et al. (2021) which indicated that in ordering medication online outside the typical supply chain, several concerns to patient safety exist, including the risk of getting counterfeit medication. Lack of professional advice, which may arise due to non supervision of a licensed pharmacist is a negative attribute for the respondents during the pandemic. A lack of communication with pharmacists regarding the use of medicine can lead to MRPs. Lastly, the presence of fraudulent online pharmacies circulating in the internet put the respondents at risk of MRPs. Being exposed to a fake online pharmacy means that consumers are at risk of getting the wrong medication, counterfeit drugs, and expired products. Some site sell medications and do not offer accurate description of the product.

5. Conclusions

Respondents perceived non-contact acquisition of medicines in the new normal as low risk for MRPs, than in-person acquisition before the pandemic. The risks perceived are shipping problems, dispensing error, drug ineffectiveness, lack of professional advice and presence of fake online pharmacies. To ensure patient safety, implementation of intervention programs is warranted. The program is recommended to be executed online to have a greater reach which includes (1) an online webinar to rapidly identify a legitimate online platform to acquire medicine, to address issues regarding online purchasing of medicines, and to improve the attitude and practice of non-contact acquirers in light of the new normal towards MRP; and (2) infographic dissemination on social media platforms that is aimed to educate the public about the non-contact acquisition and MRPs. Furthermore, the small sample size limitation of the study was acknowledged and a follow-up study with a bigger sample size is recommended to support the current exploratory research.

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