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Pattern and Practices of Self Medication during COVID-19 Pandemic in Urban Settings, Kenya:

"*Does the Corona Virus Pandemic Depict a Marginal Influence?"*

Caleb Muendo Mutua*[1];John Kyalo Muthuka'[*2];Miriam Ndunge Muthoka[3]; Francis Muchiri Wambura[4];David Okatch.

[1]*Kenya Medical Training College, Embu, Kenya.*
[2]*Kenya Medical Training College, Department of Health Education & Promotion, Nairobi, Kenya.*
[3]*Kenya Medical Training College, Head Quarters, Nairobi, Kenya*
[4]*Kenya Medical Training College, Department of Health Education & Promotion, Nyahururu, Kenya.*
[5]*Regional Coordinator, Eastern, Kenya Medical Training College*

**Caleb Mutua (PI) –*

Abstract
Background: *Self-medication is "the selection and usage of certain medication by individuals to treat self-recognized disease and symptomatology. This practice might influence health care institutes toward this point. This behavior might have certain adverse effects like wastage of resources and compromising the exact diagnosis. This practice may be defined further by theCOVID-19 pandemic and this study sought to ascertain the implications of self-medication during this period.* ***Method:*** *A cross- sectional descriptive study was conducted. Two categories of participants were included: the pharmacy customers and the pharmacy workers. The statistical analysis was be completed in two stages. Initially, a series of Student's* t*-test for independent samples to assess differences between means and chi-square test to assess categorical differences was conducted to identify potential candidate variables for the logistic regression models. Following this stage, those variables achieving in the bivariate analysis a* P *value ≤ 0.25 were included in the multivariate logistic regression models, using backward stepwise regression of variables, to examine the effects of each independent variable on the different outcomes of interest. A structured questionnaire to rate self-medication practices and its determining factors was developed in English. It consisted of demographic characteristics of study participants, types of illnesses or symptoms of illnesses for which self-medication was sought, reasons and type of requests for self-medication, sources of advice and category of drug products demanded for self-medication.****Results:****A total of 80participants, 67 (67.0%) female and (33.0%) male, were included in the study. Of the population surveyed, self- medication was reported among 67%. The most common ailments for which self- medication was used were the respiratory related ailment symptoms and fevers/headaches. Participants mostly relied on past knowledge of drugs they requested, friends' consultation and general peer pressure coupled with internet search information. Antibiotic/antimicrobials and analgesics were the most common self-medicated drugs. Key driver and factor to this specific self-medication in the era of COVID- 19 was the fear of visiting a medical facility and the perceived experience once they reached there.* ***Conclusion:*** *The prevalence of self- medication surged up during COVID- 19 peak periods, facilitated by the easy availability of drugs and information. The potential problems of self- medication should be emphasized to the general public and further restrictions to self-medication should be benchmarked.*
Key words:*Self Medication, COVID-19 era, urban settings*

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I. Introduction

Self-medication involves the use of medicinal products by the consumers to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for chronic or recurrent disease

or symptoms(Afolabi, 2008). Self-medication is the choice and use of medications by people to treat a self-diagnosed illness or symptom and it is still an important public health problem throughout the world, since it is a fairly common practice. Unjustified and inappropriate self-medication results in wastage of healthcare resources and increases resistance of pathogens, drug-drug interactions, and adverse drug reactions leading to hospital admissions (Garofalo et al., 2015). Socio cultural and socioeconomic characteristics, the previous experience with a symptom or disease, the attitude toward a disease, the way in which health-care is funded or reimbursed, the increased potential to manage illnesses through self-care, and the availability of medicinal products have been quoted as explanatory factors of the self-medication (Çelen et al., 2014).

In the past several years, self-medication has been studied in many areas and several articles have provided the prevalence among health care services attendants, general population of adults (Garofalo et al., 2015)and adolescents, students, and individuals with different health problems (Mathias et al., 2020). Corona virus disease 2019 (abbreviated "COVID--19") is an emerging respiratory disease that is caused by a novel corona virus and was first detected in December 2019 in Wuhan, China. The disease is highly infectious, and its main clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea. In China, 18.5% of the patients with COVID-19 develop to the severe stage, which is characterized by acute respiratory distress syndrome, septic shock, difficult-to-tackle metabolic acidosis, and bleeding and coagulation dysfunction. Empirical clinical data have shown that the overall case fatality rate ofCOVID-19 is 2.3% in China, much lower than those of SARS (9.5%), MERS (34.4%), and H7N9 (39.0%). The ongoingCOVID-19 epidemic has spread very quickly, and by February 15, 2020, the virus had reached 26 countries altogether, resulting in 51,857 laboratory-confirmed infections and 1669 deaths, with nearly all infections and deaths occurring in China. In response to this serious situation, the World Health Organization (WHO) declared it a public health emergency of international concern on January 30 and called for collaborative efforts of all countries to prevent the rapid spread ofCOVID-19.

Responsible self-medication requires that an individual treat their ailments and conditions with medicines that are approved and available without prescription, and which are safe and effective when used as directed (Abay & Amelo, 2010).

There are various factors that contribute for self-medication such as urge of self-care, feeling of sympathy toward family members in sickness, poverty, ignorance, misbelieves, extensive advertisement, availability of drugs other than in pharmacy, and lack of easy access to professional health-care services (Pagán et al., 2006). The prevalence of self-medication varies between the different age groups and depends on various factors such as type, severity, and frequency of illness(Pagán et al., 2006).The studies have found that fever, headache, common cold, and gastrointestinal symptoms such as acidity, diarrhea, and constipation as the most common ailments for which self-medication is being practiced. Although the frequency is less, it was interesting to note that in few studies antimicrobial have been used for self-care through self-medication (Loyola Filho et al., 2004).

In many cases, patients suffer from similar symptoms of illness, but the underlying pathology of the disease may not be the same. However, patients do not understand it and rely on self-medication that may lead to serious drug-related problems in the form of either therapeutic failure or toxicity (Ruiz, 2010).

Although it is inevitable, care must be taken while practicing self-medication. In addition, to promoting the self-medication, due to specific reasons such as affordability and inaccessibility of health-care services, the World Health Organization has also outlined the role of pharmacist in self-medication (Galato et al., 2009). As a health-care professional pharmacists can help general public on safe use of self-medication by understanding the patient illness and providing medication information (Shehnaz et al., 2013).

The conceptual framework: Depicting the normal determinants and interrelations between several factors to self-medication where COVID- -19 pandemic influences the existing structures as outlined

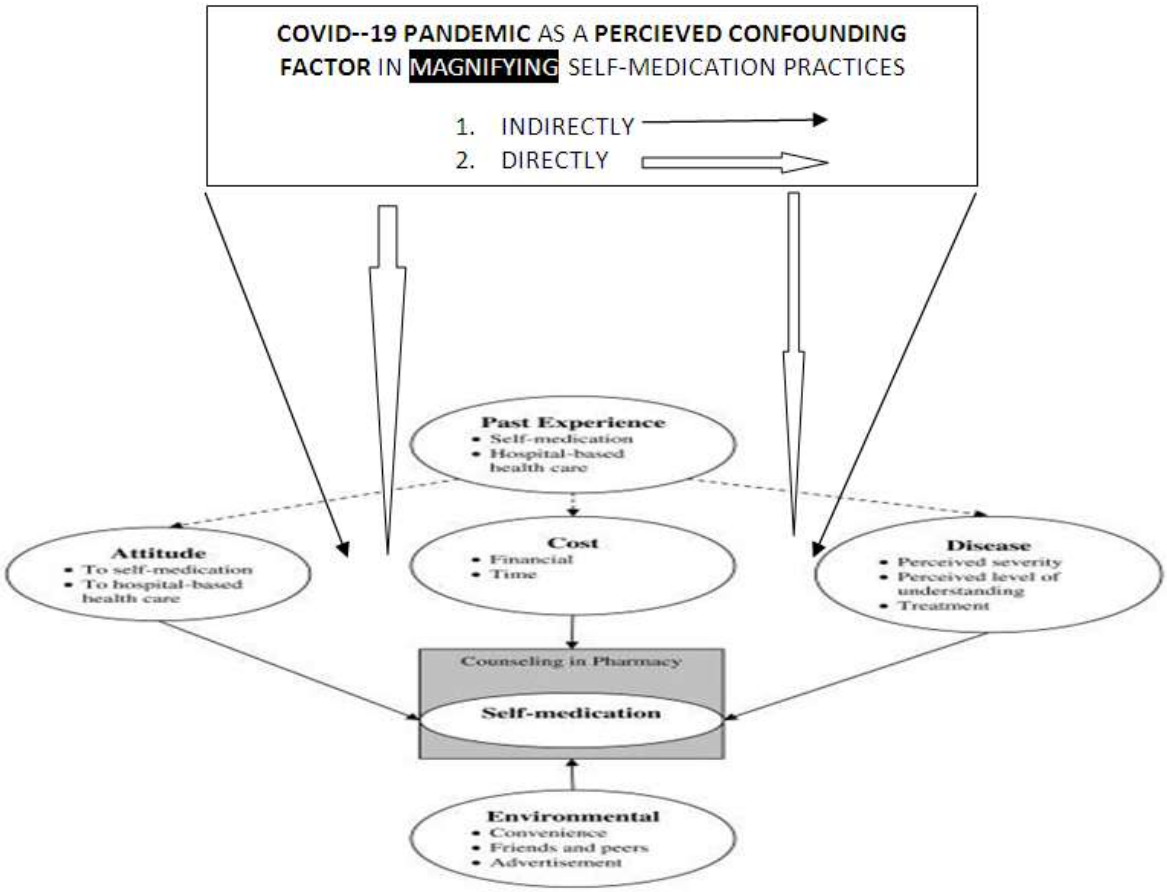

Figure 1: The conceptual framework

II. Materials And Methods

The Study was carried out in urban centers of Nairobi, *Embu* and *Thika towns in Kenya.* The regions as per the pharmacy and poisons board have vast of retail pharmacies most of them owned by pharmaceutical technologists. A cross-sectional survey was performed in the selected community pharmacies for duration of two months in the year 2020, which was June and July. Two categories of participants were included: the pharmacy customers (people who came to the community pharmacies for self-medication as per the records defined by the prescription book and the pharmacy workers (pharmacists or pharmaceutical technologists at the pharmacy setting as the in-charge or the superintendent). The targeted key population was pharmacy practitioner with valid practice license. A total of 90 subjects from the mapped pharmacy outlets were included in the study. Using purposeful sampling strategy; pharmacy customers' records were reviewed using the pharmacy personnel appointed by the in charge and the researcher in-charge of that region. All customers who purchased any medicine between 8:00 am to 6:00 pm during the above-mentioned period and could not provide a valid prescription were reviewed for several possible factors recorded. There are many pharmacies in the selected urban centers scattered in three different social-economic areas. To ensure that pharmacies from the three areas were included, four pharmacies were randomly selected from each social-economic area and a list of twelve were compiled and approached. Using purposeful sampling strategy; pharmacy customers' records were reviewed using the pharmacy personnel appointed by the in charge and the researcher in-charge of that region. All customers who purchased any medicine between 8:00 am to 6:00 pm during the above-mentioned period and could not provide a valid prescription were reviewed for several possible factors recorded (*objective three thematic area*). If medicine purchased and dispensed was in a form of tablets, capsules or pills, drops, cream/ointment or syrup, information was recorded. Majorly, it focused on whether it was a part-one or a part two poison. The statistical analysis was completed in two stages. Initially, a series of Student's *t*-test for independent samples to assess differences between means and chi-square test to assess categorical differences was conducted to identify potential candidate variables for the logistic regression models. Following this stage, those variables achieving in the bivariate analysis a P value ≤ 0.05 were included in the multivariate logistic regression models, using backward stepwise regression of variables, to examine the effects of each independent variable on the different outcomes of interest. The criterion for entering and exiting the variables in the model was, respectively, being of P value > 0.2 and P value < 0.4. Multivariate logistic regression models (Four-

levels) was constructed. The study sought approval from KMTC research ethics and review committee for ethical issues. Further approval was obtained from the community pharmacies before conducting the survey.

III. Results

3.1 Some selected social-demographic characteristics of the respondents

80 participants of over 18 years responded as per the data collection procedure both at the physical presence if that was the case and from review of records from the pharmacy in charge. Selected and available social-demographic profile guided by the baseline of the records of the participants is shown in *Table 1*. Most respondents were females at 67% and the rest, 33% males. Majority in the entire population were between 22 to 45 years of age. Two-thirds of participants were employed or self-employed (73 %). The respondents included; Muslims (n = 15), Christians (n = 49), other religions (n = 16) 75 % of female respondents and 35% of male were married. Fifty seven of the respondents (71.25%) had in previous time practiced self-medication even before COVID- 19. Majority of these were women.

Table 1: Social-demographic characteristics of the respondents

Age range	18–60 years
Gender (n)	
Male	26
Female	54
Education (n)	
Primary education	5
Secondary education	25
Tertiary education	50
Religion	
Christian	49
Muslim	15
Others	16

3.2 Prevalence and frequency of practice of self-medication among the respondents

68(78%) participants reported self-medication with therapeutic intention during the period of corona-virus control measures. 58% self-medicating clients sought for drugs purportedly for common ailments like; flu, food poisoning, coughing (for children) and a cluster in this percentage, sought for medications which are for long-term chronic conditions such hypertension, gouty arthritis, sinusitis and diabetes. 12% sought for nutritional supplements and herbal/traditional medicines, and 30%, requested for antibiotics and antimicrobial agents without even a prescription. 45%) used multiple medicines and this was commonly among clients with existing conditions who were supposed to visit a medical facility for constant check-ups and follow-ups. Intake of 5 different medicine clusters were reported (0.29 per client on average), of which 2 were NSAIDS and steroid based molecules (0.19 per client) and 1.5, anti-bio-tics and anti-microbial based agents (0.12 per client on average), whereas, 1.5 was for severe pain alleviation in some clients with conditions like arthritis or some form bone related/ joint and muscle pains. This also included muscle-relaxants all at 0.13 per client. No differences in self-medication practices were seen across area of origin, age group or monthly income. Frequency of self-medication differed across different clusters of clients with those having an existing chronic ailment and being a female having the highest frequency (80%) of the total sampled (27. %) ($P < 0.05$).

3.3 Stratified Indications for Self-medication

Of those who had practiced self-medication, 23% used pain prophylaxis due to an existing condition, commonly arthritic pains. Modes of pain prophylaxis administration were as follows; oral, 76.3%, gel, 13%, spray for example, deep heat, 21 %. None sought for herbal/traditional medicines for pain prophylaxis.
Indications for self-medication for symptom relief are given in Table 2.

Table 2: Indications for self-medication

Symptom	**Frequency (n = 80)**
Pain	36 (45%)
Respiratory symptoms	
Upper respiratory tract symptoms	15(18%)
Lower respiratory tract symptoms	10 (8%)
Fever	21(25%)
Dysmenorrhea	11 (10.2%)
Muscle cramps	10 (8%)
Abdominal pain/colic	5(4%)
Superficial wound/skin rash	3 (2.4%)
Other	5 (3.9%)

3.4 Sources of information to seek self-medication from a community pharmacy

Most of client from inquiry were found to have had information from internet and books and this was followed by information among peers. Such was found to be among clients who had a similar condition or had a relative with such condition with the peer who was seeking such formation. Only 4 percent were perceived to get information from others who were presumed to be health practitioners or quacks (Figure 2).

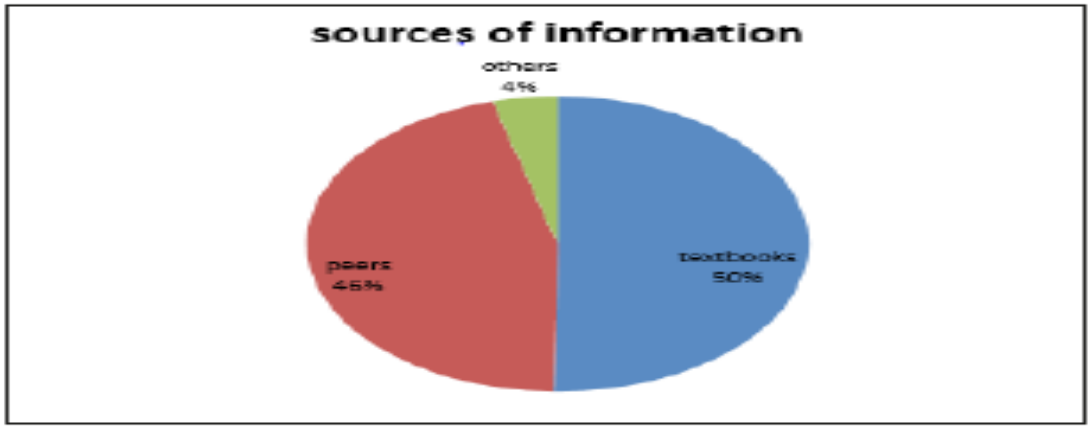

Figure 2: Source of Information

3.5 The class of drugs frequency

Anti-pyre-tics followed by NSAIDS showed a more common use and were used even in pain associated with infections. Sedatives and hypnotics recorded the smallest frequency while antibiotics took a mid-position (Figure 3)

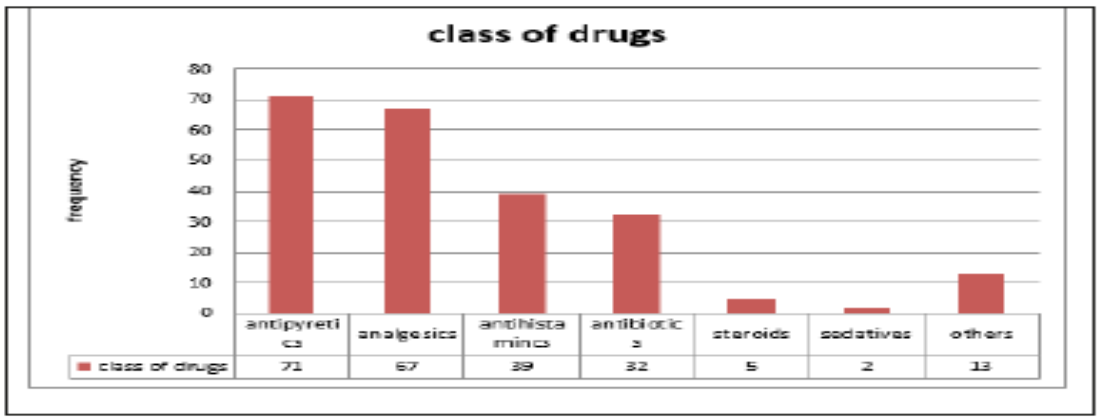

Figure 3: *Class of drugs' use*

3.6. Reasons for self-medication

3.6.1.Within theCOVID-19 pandemic period

Majority seeking self-medication or practicing the same reported fear of visiting the health facility for fear of being tested for COVID- 19 and hence subsequent quarantine should they be positive. On this note too, following advice that some medication coupled with home remedies are good to keep corona virus at bay was also practiced. This accounted for 43 % 0f the respondent with a similar concern of not trusting a medical facility at 18% as shown in table 3, below

Table 3: Reasons for self-medication

Variable	**Frequency[%]**
Fear of COVID- 19 test	43
Direction by physician to manage such conditions	2
To play an active role regarding my health	7
Relatives, friends, media advice	12
Improper service this COVID- time	15
The given drug by doctor not helping	3
I don't trust hospital/doctor for now	18
Total response	100

3.6.2. Among the pharmacy-personnel respondents

Among the pharmacy personnel respondents, a similar trend on fear of COVID- 19 was perceived. In this with 39% on COVID- related issues and 30%, an existing habit.

3.7 Factors associated with self-medication within the stipulated period of the survey(Odds ratios and their 95% confidence intervals for the relationship of self-medication with some included factors)

Multivariate analysis was performed to evaluate the factors associated with self-medication during the COVID-19 era other than the trends in the normal periods. Variable-factors (6) were linked with self-medication at P<0.05 during bivariate analysis and were considered in a multiple regression analysis as shown in table (). After running all these factors using multinomial logistic regression by specifying the 'backward conditional' progressive stepwise model with removal at P<0.05, one factors was retained in the final analysis (reduced model) as presented in **Table 4.**, Fear of hospital in corona virus era/ Fear of corona virus test [AOR=2.2; 95%CI: 1.1-5.2; P=.022]. Surprisingly, all the other factors at full and reduced models were found to be insignificant as a reason for self-medication that time of high peak of the corona virus pandemic. Again, the convenience of time factor and easy access to medicines was also not very significant that time as per this study findings [AOR=0.7; 95%CI: 0.2-2.2; P = .47] after controlling for significant moderating variables during multiple regression analysis.

Table 4: *Logistic* ***regression of factors associated with self-medication***

	Self-Medication		**C.I**	**P-VALUE**
	Yes n (%)	**No n (%)**		
	47	33	1.0	0.470
To play an active role regarding my health			0.7 (0.2-2.0)	
Relatives, friends, media advice	36	44	1.2 (0.3-4.6	0.728
			1.0	
Improper service this COVID- time	48	32	1.7 (0.8-3.5)	0.154
			1.0	
The given drug by doctor not helping	51	29	0.5 (0.2-1.1)	0.097
			1.0	
I don't trust hospital/doctor for now	42	38	0.9 (0.4-1.9)	0.822
			1.0	-
Fear of hospital in COVID- era/ Fear of COVID- 19 test	**66**	**14**	**2.4 (1.1-5.2)** **1.0**	**0.022**

IV. Discussions

4.1 Introduction

This study assessed the prevalence and associated factors of self-medication among the general population in urban settings using community pharmacies as the point source of seeking such a service. In this study, we have reported the prevalence and associated factors of self-medication as a whole to have the overall picture of the same in the context of it during the perceived times of corona virus pandemic at the peak. In addition, we table the reasons, ailments, cluster of drugs and medicine, source of information, and associated factors for both among both the clients seeking such services and the pharmacy personnel, because some of the previous studies reported self-medication by the usual factors in the normal environment devoid of the corona pandemic

4.2 Prevalence, Patterns and Trends of self-medication

Self- medication is becoming an increasingly important area within healthcare, and this study has shown that it was even more prevalent during the corona virus pandemic peak period. This study has found a prevalence of self- medication of 67 % in COVID- era period as per this study in contrast to 58.2% the prevalence in normal trends (Kenya bureau of statistics, 2017). This variation might be due to the difference in the study period and the associated corona virus pandemic. It is also noted that a high level of this practice is among the female gender as compared to the male gender. This is like the findings in a study conducted by (Sema et al., 2020).In the study it was noticed that the classes of drugs that were commonly used were antipyretics analgesics, antihistamines and antibiotics. This is like studies done earlier (Jain, 2011). Study established that self- medication is very common among Kenyan population and the practice can be propelled by similar events or disasters which may affect the ability to seek health care services from medical facilities, facilitated by the easy availability of drugs, and information from internet. This is similar to a study done in previous period even before COVID- 19 pandemic (Mythri, 2016). The prevalence of self-medication was noted to be at 67 % similar to findings in other studies during interrelated disasters or in accessibility to health services. (Dumitrescu et al., 2020).Various studies conducted in different locations of the world has shown a range of SM practices between 8.3 to 87% (Pagán et al., 2006; Verma et al., 2010; Wabe et al., 2012). The

reasons for this wide variation might be differences in socio-demographic characteristics of the study participants including academic status, non-availability of medical facilities in some areas, easy availability of drugs, and types of drugs that the study intends to identify.The practice of self-medication was higher among females (67%) than males (33%). This was found to be statistically significant. This is similar to some other studies (Patel et al., 2013), which identified female students as fundamental elements in the use of OTC drugs. There was a common trend of using medications for respiratory symptoms associated with the fear of possible COVID- 19 infection, with an aim of preventing the disease from a layman's perspective as compared with the period before the COVID- pandemic, This is commensurate with a study done in India (Ahmad et al., 2015).

4.2 Factors associated with self-medication within theCOVID-19 pandemic period among a sub-population in urban setting in Kenya.

We found out that the most common factors that led to self-medication among the participants as ascertained from the pharmacy records, face to face interviews where it took place and response from pharmacy personnel were attributed to attitude towards health facilities during the peak period of corona virus, the relative /friend's influence distance of the school clinic to the hostel, and perceived inefficacy of of service as at that time, all these at the bivariate analysis. The main factor of self-medication was the fear of visiting the medical facility/ getting tested for the COVID- -19, at logistic regression, AOR=2.4, P value=<.05. Similar to this findings, various studies reported different reasons for engaging self-medication. These include knowledge about the disease/treatment, previous experience, availability of medications, mild diseases, affordability, and to save time. These reasons however are subject to the environment and study populations where the studies were carried out, all this summing up as the key indirect determinants of the perceived fear of visiting a medical facility as it is in this current study (Auta, 2012; Verma et al., 2010; WHO, 2015).

4.3 Conclusions and recommendations

This study concluded that majority of the respondents practiced self-medication and this was majorly attributed to fear of visiting the medical facility with a perceived knowledge of being tested for the corona virus, and, possible quarantine/isolation post-testing. Commonly used drugs were those related to treating respiratory infections and NSAID and these were majorly by the female gender as compared to male counter-parts. Self-medication may not be harmful on its own, but it poses a great threat when OTC and prescription drugs become abused. The most typical sources of drug information about the available modern drugs for SMP were consultation by a friends, drug experience from previous treatment, and self-knowledge on drugs. Health education on self-medication in regards to part-1 poisons should be scaled up through PPB mandate and foster ahead, the restrictions of self-prescription among both the clients and the pharmacy practitioners despite the changes in the environment since, the practice could further compromise the health of the affected subjects immensely. The pharmacy personnel should also focus more on the safety of the citizens by rejecting extreme request for self-medication despite the situation at hand, also encourage the general public to visit a health facility with a comprehensive clinical diagnostic approach for their own safety.

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