TURKISH REPUBLIC OF NORTH CYPRUS
NEAR EAST UNIVERSITY
INSTITUTE OF GRADUATE STUDIES

COMMUNITY PHARMACISTS IN NORTH CYPRUS & COVID19: PERCEPTION, ATTITUDE AND EXPERIENCES

By:

MAHER RAHIMA

MASTERS

A THESIS SUBMITTED TO THE INSTITUTE OF GRADUATE STUDIES NEAR EAST UNIVERSITY

DEPARTMENT OF CLINICAL PHARMACY

2021-NICOSIA

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APPROVAL

We certify that we have read the thesis submitted by **Maher Rahima** titled "**COMMUNITY PHARMACISTS IN NORTH CYPRUS & COVID19: PERCEPTION, ATTITUDE AND EXPERIENCES"** and that in our combined opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Health Sciences.

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ABSTRACT

Introduction: Severe acute respiratory syndrome coronavirus 2 (SARS CoV-2) has created new norms in our daily lives from social interactions with others to seeking essential healthcare services. Pharmacists represent an important part of the health care system all over the world, their role is important and critical to complete management cycle for coronavirus outbreak.

Aim: The study intended to assess community pharmacists' opinions, concerns, preparedness and experience about the novel COVID-19 pandemic.

Methods: a cross-sectional study was carried out by distributing a validated revised pilot tested survey tool to a representative sample of community pharmacists in North Cyprus. The study tool contained 30 items divided into two main sections and was answered face to face by each respondent. A Consent form was signed prior to participation. The duration of the data collection was 2 months.

Result: Out of 302 pharmacies approached; 173 pharmacists responded to the survey (response rate = 59.6%). Most of the respondents were females (n=121, 69.9%) while males were (n=52, 30.1%). The findings showed that only 33.5% of pharmacist received a form of training, and those received training had more positive perception toward the role of pharmacist in the pandemic than others. More than 85% of responders depend on WHO reports as information resource while around 87% educate their patients regarding masks use, social distancing and hygiene most of the responders suggest to provide free tests for everyone regardless if they have symptoms or not (152, 87.9%).

Conclusion: Participants believed that pharmacists have a vital role in COVID-19 pandemic but also have some fears or concerns of their role in the current pandemic. The findings support the need to improve the pharmacist's knowledge and the using of trusted and reliable resources for information in such a pandemic.

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ABBREVIATIONS

1. MHV: Mouse hepatitis virus
2. TGEV: Transmissible gastroenteritis virus
3. MERS-CoV: Middle East Respiratory Syndrome Corona Virus
4. SARS-CoV: Severe Acute Respiratory Syndrome Corona Virus
5. SARS-CoV-2 Severe Acute Respiratory Syndrome Corona Virus 2
6. CDC: Centre for Disease Control
7. WHO: World Health Organisation
8. RBDs: Receptor Binding Domains
9. ACE2: Human Angiotensin-converting enzyme 2
10. ARDS: Acute respiratory distress syndrome
11. CRP: C-reactive protein
12. LDH: lactate dehydrogenase
13. CK: creatinine kinase
14. COVID19: Corona Virus Disease 2019
15. RT-PCR: Reverse Transcription Polymerase Chain Reaction
16. BSL: Bio Safety Level
17. FIB: The International Pharmaceutical Federation

1. INTRODUCTION:

On December 2019 in the city of Wuhan, in the Hubei province of China, an outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was detected. Following the underlying episode, the infection spread to different nations by means of offbeat examples, an example average for irresistible illnesses because of the presence of various disease sources. On January, 2020, the WHO changed the status of the outbreak to confirm a Public Health Emergency of International Concern. In March 2020, WHO consider COVID-19 as a pandemic since more than 100 country affected by the virus in a few weeks. (Bahlola and Dewey, 2020)**.**

Severe acute respiratory syndrome coronavirus 2 (SARS CoV-2) has made new standards in our day by day lives from social collaborations with others to looking for fundamental medical care administrations. The exceptional pace of novel Covid infection (COVID19) spread has overwhelmed most general wellbeing authority as the absolute number of affirmed cases presently remains at more than 10 million (Zaidi and Hasan. 2020).

Pharmacists represent an important part of the health care system all over the world, their role is important and critical to complete management cycle for coronavirus outbreak. On the March 19, 2020, the International Pharmaceutical Federation (FIP) released a guideline to clarify the required coronavirus information for pharmacists and the pharmacy workforce, in addition this guideline specified role and responsibility for both hospital and community pharmacists in controlling this outbreak (Iman et al., 2020).

Furthermore with the continuous increasing of the cases all around the world it is important to explore how pharmacists are managing their customary and newly emerging roles during the COVID-19 outbreak (Iman et al., 2020).

Finally to conclude this study aim to assess the experience of the pharmacists whom working in community pharmacies in north Cyprus about the novel covid-19 virus and to check their opinions about the disease and reveal their preparedness, plane and concerns. Moreover the study discusses the managements that took by each community pharmacy and pharmacist about how they dealt with the disease and the patients and how they provided the protection to themselves, their pharmacy stuff and the pharmacy

customers. Also this study goal to provide more information to the literature about the novel COVID-19 pandemic and, the critical role of pharmacist in this difficult time.

2. BACKGROUND:

2.1. Pandemic Diseases

A pandemic is defined as the global outbreak for a disease. There are many examples in history, the most recent being the COVID-19 pandemic, declared as such by the World Health Organization on March 12, 2020 (Hickoc, 2020).

Pandemics are generally classified as epidemics first, which is defined as rapid spread of disease across specific area or areas. In Brazil in 2014 Zika virus outbreak began and made its way across the Caribbean and Latin America was an epidemic, same as Ebola outbreak in 2014-2016 in West Africa. According to the U.S. Department of Health and Human Services, U.S. has been experiencing an opioid epidemic since 2017 due to the widespread and misuse of drugs that lead to high numbers of deaths (Hickoc, 2020).

In China COVID-19 began as an epidemic, then in a matter of months it made its way all over the world and became a pandemic. But epidemics don't always become pandemics, and it's not always a fast or clear transition. For example, in West Africa HIV was considered as an epidemic for many decades before turning to a pandemic in the late 20th century. According to the American Medical Association, HIV is considered recently as an endemic due to the advances in modern medicine, this means the rate of the disease is stable and predictable among certain population (Hickoc, 2020).

Diseases that can be passed from animals to humans are called Zoonosis. They are also called zoonotic diseases (Wells and walash, 2020). Animals can carry harmful germs, such as bacteria, viruses, parasites, and fungi. These germs are then shared with humans and cause illness. The Zoonotic diseases can be ranged from mild to severe, while some of them can be fatal. Zoonotic diseases are widespread both in the U.S. and worldwide. The World Health Organization (WHO) reported that 61% of all human diseases are

zoonotic in origin, while 75% of new diseases that discovered in the last decade are zoonotic. Around 100 years ago and before the introduction of new hygiene regulations, zoonotic diseases such as glanders, bovine tuberculosis and bubonic plague caused millions of deaths. They are still a major problem in developing countries. Smallpox, falciparum malaria, measles, and bubonic/pneumonic are an example of zoonosis (Seymor and schulman, 2018).

H1N1 ′′swine influenza (2009), Ebola fever and chikungunya (2014) and Zika (2015) were some of pandemics that appeared in the last decades and scared the whole world (Wells and Walash, 2020).

There are four endemic coronaviruses that can pass on to humans, so that coronaviruses must have appeared as a pandemic infection in the past when viruses were discovered as a human′s diseases. The virus transmitted from animal to human, most likely the civet cat, in the time period 2002–2003, this caused near-pandemic that disappeared later on due to the responses to public health control measures (Seymor and schulman, 2018).

2.2. Infectious Diseases That Have Emerged In the Past

In pondering the new irresistible illness developments, it is important to consider the right now existing infectious diseases that were arisen previously and afterward turned into an endemic following not many years (common in people) or enzootic (pervasive in creatures).

These viruses and diseased caused by the viruses, can give us with evidences related to persistence and mechanisms of diseases, also it can lead us to reasons that prevent us from controlling many diseases. The way that numerous past arising irresistible microorganisms and infections (in the future assembled as "organisms") have adjusted to stable conjunction with individuals is proven by the presence of endogenous retroviruses in human DNA and through contamination by herpes infections like cytomegalovirus (CMV), varicella-zoster virus (VZV), herpes simplex virus (HSV) and Epstein-Barr virus (EBV).

For instance VZV is a profoundly cytolytic, infectious, and lethal infection, which has adjusted to get by in human populaces in since a long time ago go through complex endurance instrument. Not at all like other exceptionally infectious human-adjusted respiratory infections like measles, that requires extremely huge populaces to try not to debilitate vulnerable people, VZV sets up inactive noncytolytic diseases in human ganglia, occasionally reactivating into an irresistible/cytolytic structure (zoster) that can be communicated to new birth associates of helpless people to be showed as profoundly infectious varicella. Human irresistible specialists, for example, retroviruses, herpes infections, and other infections reveal to us that rises of specific sicknesses before numerous years may prompt long haul microbial endurance through co-selecting our hereditary, cell, and invulnerability systems to guarantee their nonstop transmission. In view of British researcher Richard Dawkins phrasing, advancement happens at quality rivalry level, phenotypic people are just hereditary "endurance machines" in the opposition interaction between individuals and organisms.

It could involve point of view that is in the developmental driver's seat. This viewpoint embroils our perspective and responses to arising irresistible infection dangers. According to human's perspective, the cutting edge endemic illnesses arose at some unnoticed time previously, and a portion of these sicknesses made due by receiving long haul and convoluted endurance techniques, that give a convincing establishment to quick and long haul control systems

In the first place, relieve contamination's spread, sickness, and demise right away. Second, it is basic to forestall the ingenuity of microorganisms that may prompt extra developments that are aggregately dangerous than the first rises

Hereditary relatives of 1918 flu pandemic infection are as yet causing occasional episodes everywhere on the world, and as yet killing aggregately a huge number of individuals, this is a solid update that solitary illness rises may prompt numerous outcomes past quick horribleness and mortality. In the antiquated continuous battle among microorganisms and man, hereditarily more versatile organisms have the advantage in reliably amazing us and frequently getting us ill-equipped (Morens and Fauci, 2020).

Year	Name	Deaths	Comments
430 BCE	"Plague of Athens"	~100,000	First identified trans-regional pandemic
541	Justinian plague (*Yersinia pestis*)	30–50 million	Pandemic; killed half of world population
1340s	"Black Death" (*Yersinia pestis*)	~50 million	Pandemic; killed at least a quarter of world population
1494	Syphilis (*Treponema pallidum*)	>50,000	Pandemic brought to Europe from the Americas
c. 1500	Tuberculosis	High millions	Ancient disease; became pandemic in Middle Ages
1520	*Hueyzahuatl* (*Variola major*)	3.5 million	Pandemic brought to New World by Europeans
1793–1798	"The American plague"	~25,000	Yellow fever terrorized colonial America
1832	2nd cholera pandemic (Paris)	18,402	Spread from India to Europe/Western Hemisphere
1918	"Spanish" influenza	~50 million	Led to additional pandemics in 1957, 1968, 2009
1976–2020	Ebola	15,258	First recognized in 1976; 29 regional epidemics to 2020
1981	Acute hemorrhagic conjunctivitis	rare deaths	First recognized in 1969; pandemic in 1981
1981	HIV/AIDS	~37 million	First recognized 1981; ongoing pandemic
2002	SARS	813	Near-pandemic
2009	H1N1 "swine flu"	284,000	5th influenza pandemic of century
2014	Chikungunya	uncommon	Pandemic, mosquito-borne
2015	Zika	~1,000?*	Pandemic, mosquito-borne

Figure 1. Pandemics Statics (Morens and Fauci, 2020).

2.3.The Role of Pharmacist in Pandemics

Pharmacists play an idol role among health care professionals; they are the last line of health system that the patient communicates with before starting their treatment (Canadian Pharmacists Association, 2009). And in the pandemic situations they even play a bigger roles that help to prevent the outbreak and heal the patients so along with their ordinary roles the pharmacist have to add a new role that align with the pandemic situation and as an example:

Front line surveillance and alert

As the most accessible health care professional, pharmacists play an important role in planning communications to the public in pandemic event. Pharmacists can convey concise and up-to-date information to the public. Also they can alert public health officials of possible outbreaks. The Ontario Pandemic Plan has developed various data collection tools to assist with influenza surveillance (Canadian Pharmacists Association, 2009).

Triage and patient Referral

Pharmacists have significant job by ensuring that wiped out individuals avoid the solid ones to forestall infection transmission. You might be the primary line of contact for patients who are at present encountering influenza side effects and are anticipating

finding. Patients who have been sent from the clinic to rest will likewise reasonable group to drug stores for answers to their wellbeing concerns. Quite possibly the main parts of the drug specialist will be to oversee patients with gentle sickness so they don't have to get to the overburdened intense consideration settings.

Pharmacists will be needed to direct and instruct on manifestation recognizable proof, strong administration and when and where to look for clinical help. Expanded responsibility and flood of patients into drug stores will require reassessment of the apportioning interaction to permit experts to deal with the circulation of drugs and permit pharmacists to give direct quiet consideration. Pharmacists may likewise be needed to take an interest in dynamic, restorative administration and appointed recommending of immunizations, antivirals and anti-microbials. Pharmacists might be the solitary medical services experts locally (particularly far off and country networks), in which case you might be needed to take on extra obligations and duties during the pandemic. They endeavor to ensure that people are very much educated and mindful of involved duties by connecting with neighborhood crisis associations and general wellbeing authorities

Pharmacists might be engaged with directing mass immunization facilities and might be called upon to help at non-conventional locales (e.g., public venues, schools). Pharmacists might be approached to take an interest in the dissemination and capacity of immunizations and different drugs. (Canadian Pharmacists Association, 2009).

Communication

Pharmacists will be needed to set up and keep up relations with government, drug store affiliations, drug stores (both local area and clinic) and different gatherings inside the local area so fundamental administrations of the drug store can in any case work in case of a pandemic

Pharmacists should likewise keep an open line of general wellbeing bodies, government, and drug store relationship to give brief, key informing, and guarantee that exact data is being spread to people in general. These interchanges ought to likewise incorporate avoidance measures and a conversation of your business congruity plan. Informing should be steady, exact, suitable and forward-thinking when being imparted to the general population.(Canadian Pharmacists Association, 2009).

Planning

The drug specialist should step up to the plate and become educated on neighborhood arranging drives inside the local area. Public and commonplace drug store affiliations; general wellbeing locales; colleges; and governments are bodies that might be creating plans

Additionally, the pharmacist should make a point to know about the plans locally and getting comfortable with how the drug store and staff will be engaged with these plans. Arranging is fundamental to guarantee that the drug store administrations will be completed, regardless of whether the drug specialist needed to give assistance in an alternate region. The more the pharmacist readies, the better he/sheable to adapt to the monetary, social and natural strains when the pandemic flu strikes. (Canadian Pharmacists Association, 2009).

2.4. Novel COVID 19

2.4.1. Overview of coronaviruses

Corona viruses are an enormous gathering of creature infections from Coronaviridae family cause sickness to human and birds. In the past these infections had a long history and related with viral flare-ups. The first Covid was found in 1930 when respiratory contamination in chickens brought about by irresistible bronchitis infection (IBV). In 1940, two creatures Covids were confined, they were described as mouse hepatitis infection (MHV) and transmitted gastroenteritis virus (TGEV)

In 1960 the principal human Covid was confined and portrayed as human Covid 229E and human Covid OC43. The latest Covids that caused sickness and viral flare-up for individuals are SARS-CoV in 2003, HCoV NL63 in 2004, HKU1 in 2005, MERS-CoV in 2012, and SARS-CoV-2 of every 2019 (Al-Rohaimi and Al Otaibi, 2020)

Coronaviridae family is a huge gathering of creature infections that was ordered into four subgroups as alpha, beta, delta, and gamma Covids. In light of discoveries of literary works and logical investigates, all Covids that has a place with beta gathering seemed to make infection flare-up people. While Covids that taint birds are

characterized under delta and gamma subgroups. It has been hypothesized wild creatures are the normal supply of Covids; nonetheless, numerous Covids species likewise propensity in homegrown and business creatures

Essentially beta Covids that taint people influence the respiratory upper and lower aviation route and cause intense and contaminations that may move to persistent cases. Serious Acute Respiratory Syndrome (SARS) is a well-known wording utilized in Covids contaminating people. These infections influence human respiratory lot on the grounds that the infection spike protein has higher partiality with hACE2 receptor

The infections seriousness in youngsters, grown-ups, and the old is characterized utilizing the differential articulation of hACE2. ACE2 articulation isn't restricted to respiratory aviation route it influence different tissues different tissues too get contaminated with SARS-CoV like gastrointestinal plot, kidney, heart, and liver. The rate and degree of disease additionally rely upon the idea of infections, i.e., wild sort versus freak (Al-Rohaimi and Al Otaibi, 2020).

2.4.2. Coronaviruses outbreak and human health

Over the most recent twenty years, the world had seen numerous viral episodes that were related with human misfortune everywhere on the world. In view of aftereffects of logical examinations, the creature infections acquired the ability to cross-species and to taint people. In 2002 the main SARS-CoV flare-up began in China, it was connected with wild creatures and fish marker. Essentially, MERS-CoV episode in 2012 in the Middle East nations tracked down a comparative disease designs

In viral episodes scientists quick to comprehend the connection among creature and human. In the two instances of SARS-CoV and MERS-CoV, infection obtained hereditary changes that empower species to hop and to track down another host. As of not long ago, there is no exact medication or antibody for prior Covids, likewise novel SARS-CoV-2 doesn't make another danger to our medical care framework

The scientists accept that human connection with creatures may be a critical danger factor in moving infections from creatures to new has, including people. This was accounted for in H1N1 case in 2009, where the association among human and creature infections (pigs and birds) produced a flu episode

Analysts of SARS-CoV-2 field accept that counterfeit natural surroundings of untamed life creatures bountiful in a few Covids permitted to cross-respond and get transformed in more intricate and microbe serotype. Notwithstanding, the specific component of novel SARS-CoV-2 episode from creature to human not yet investigated, and scientists are attempting to comprehend factors driven such flavors migration (Al-Rohaimi and Al Otaibi, 2020).

Novel SARS-CoV-2 outbreak

Numerous cases were first announced with puzzling viral pneumonia in Wuhan city in China In December 2019. The starter discoveries showed every one of the cases had H1N1, with indications like influenza manifestations. Inside 90 days the infection novel SARS-CoV-2 spread across the world bringing about pandemic that danger to human health. There are progressing research endeavors to comprehend the component of SARS-CoV2 passage into the host cell and the part of the receptor restricting area (RBD) of spike protein. The pandemic brought about by novel SARS-CoV-2 has made human existence to end and causing a genuine worldwide general wellbeing and stay to change over the long run

US of America, Italy, and Spain were the most exceedingly awful influenced nations outside China. As of late fast expansion in novel SARS-CoV-2 cases were accounted for in Brazil, Russia and India. The detailed disease and death rates were higher in the United States of America and Europe contrasted with Asian and the Middle East nations

The discoveries of continuous late explores that intend to comprehend the beginning of the viral episode in Wuhan city in China, showed an exhibited regular instrument of SARSCoV to cross the species, likewise it announced transformations in receptor restricting spaces (RBDs). Likewise, the aftereffects of beginning examinations everywhere on the world have shown hereditary varieties in SARS-CoV-2 strain

These varieties may influence contaminations and passing rates, it additionally considered as a test in antibody and restorative turn of events. The receptor-restricting spaces in spike proteins of SARSCoV-2 had shown promising freedoms for medication and immunization advancement (Al-Rohaimi and Al Otaibi, 2020).

2.4.3. Human to Human Transmission

As per WHO and CDC rules, human to human transmission happens basically by means of drops (both oral and nasal) and mist concentrates create during wheezing, hacking, and talk. Actual contact with COVID19 patients, different surfaces, and sharing of family stuff are different methods for numerous surfaces (International Pharmaceutical Federation, 2020). There are numerous different wellsprings of disease with novel SARS-CoV-2, like stool and sputum (Semple and Cherrie, 2020)

The new examination discoveries have shown that the danger of disease may increment in COVID emergency clinic's serious consideration units because of the absence of legitimate pressing factor ventilation frameworks. As indicated by discoveries of some developing explores, the feasibility of novel SARS-CoV-2 in air, clinic climate and individual defensive gear may expand the danger of disease. Thinking about the accessible logical writing regarding NCBI, the gigantic disease pace of novel SARS-CoV-2 is because of asymptomatic patients

Too tale SARS-CoV-2 titer additionally characterizes contamination and seriousness pace of infection. The pace of contamination and inclined to mortality is higher between current defensive cog wheels in ICU clinical and paramedical staffs because of higher viral titer esteem (Al-Rohaimi and Al Otaibi, 2020)

Coronavirus

Contamination of novel SARS-CoV-2 principally influences the respiratory aviation route by restricting with hACE2 receptor present on mucosal cells. A few neurotic results that varies between patients comes about because of restricting of spike proteins RBDs with hACE2. Presently, thinking about ebb and flow research discoveries and clinical results, the contamination may prompt the side effects as per the seriousness of illness i.e., gentle, moderate, and extreme (Al-Rohaimi and Al Otaibi, 2020). The tale SARS-CoV-2 contamination prompting COVID19 is as yet connected with the accompanying;

Gentle disease/non-suggestive: Patients' simple upper respiratory lot viral contamination may have vague manifestations like fever, weakness, hack (with or without sputum creation), anorexia, discomfort, muscle torment, sore throat, dyspnea, nasal blockage, or migraine. Infrequently, patients may likewise give loose bowels, queasiness, and regurgitating (Al-Rohaimi and Al Otaibi, 2020) .

Pneumonia: Prevalent in huge populace where tainted patients with pneumonia anyway absence of extreme pneumonia indications however require oxygen support (Al-Rohaimi and Al Otaibi, 2020) .

Intense respiratory trouble condition (ARDS): The most vital period of contamination of novel SARS-CoV-2 and sicknesses COVID19 can be seen inside multi week of disease, patient may foster ARDS, which is portrayed by respective opacities, lobar or lung breakdown, or knobs on CXR or CT filter (Al-Rohaimi and Al Otaibi, 2020).

While the incubation period of the SARS-CoV-2 is still not confirmed the symptoms usually appear between 2 to 14 days of infection. Also the carrier (infected person) that not showing any symptoms may transmit the virus to the others but that has not been confirmed as a scientific fact yet (Bradley,m , 2020).

Moreover, findings of existing researches show that the key symptoms for patients in COVID 19 include fever (87.9%), cough (67.7%), fatigue (38.1%); low occurrences of diarrhea symptoms (3.7%) and vomiting (5.0%). At the same, based on individual immune capacity and pathophysiology, patients remain asymptomatic for several days, acting as a potential carrier for SARSCoV-2 (Al-Rohaimi and Al Otaibi, 2020).

The exploration results additionally show that an enormous level of COVID 19 patients are described by lymphopenia (82%) and thrombocytopenia (36%). The research center discoveries have shown that the greater part of the COVID-19 patients remain related with raised degrees of C-receptive protein (CRP), lactate dehydrogenase (LDH), and creatinine kinase (CK) (Al-Rohaimi and Al Otaibi, 2020)

Clinical discoveries show that even an enormous level of COVID-19 contaminations creates to gentle or simple sickness, just around 14% creates to extreme illness that requires hospitalization and oxygen support, and out of this 5% expect admission to an emergency unit to intense respiratory misery condition (ARDS), sepsis and septic stun, multi-organ disappointment, including intense kidney injury and cardiovascular injury (Al-Rohaimi and Al Otaibi, 2020)

On account of novel SARS disease the high fondness of viral proteins with have receptors increment the danger of different organ disappointment. Hazard factors that require ICU affirmation and may cause passing are more established (Age > 60 years) and co-sullen sicknesses like previous of cardiovascular infection, persistent kidney illness, diabetes mellitus, hypertension, ongoing respiratory infection, and immunocompromised states (Al-Rohaimi and Al Otaibi, 2020).

2.5. Global spread and pandemic: Overview of the global spread of novel SARS-CoV-2

In December 2019 the worldwide spread of novel SARS-CoV-2 began from Wuhan city in China the episode site. The huge and continuous air travel between China, Europe, the United States, and another piece of the world conveyed novel SARS-CoV-2 (Al-Rohaimi and Al Otaibi, 2020) .

In December 2019 and early January 2020, feeble checking and reconnaissance courses of action at the air terminal lead to disappointment in containing the infection. Exploration discoveries have exhibited that it's anything but a novel SARS-CoV-2 contaminated and asymptomatic populace that conveyed over 80% of diseases from Wuhan, China, to the remainder of the world (Al-Rohaimi and Al Otaibi, 2020).

The worth of R0 for novel SARSCoV-2 is 2e3, the pace of disease continue to increment and lead to a pandemic flare-up because of absence of careful steps (Al-Rohaimi and Al Otaibi, 2020)

Numerous nations acquire accomplishment in lessening contamination stack and smooth novel SARS-CoV-2 sickness bend (Al-Rohaimi and Al Otaibi, 2020)

The quick finding of the illness, isolate/seclusion offices, solid and compelling global positioning framework and giving sufficient training about novel SARS-CoV-2 stay basic variables in lessening pace of contamination in Australia, South Korea, Taiwan, Japan and New Zeeland

In numerous nations, for example, Europe and the United States of America the preventive apportions were administered bringing about an enormous flare-up of novel SARS-CoV-2. Social separating is suggested by WHO, CDC, and disease transmission specialist everywhere on the world as significant instrument for lessening contamination rates. Social separating can be accomplished deliberately and additionally by putting limitations as a lockdown (Al-Rohaimi and Al Otaibi, 2020).

2.5.1. Characteristics of older patients infected with COVID-19

The tale COVID-19 can taint anybody in any case their age and individuals who are in the hatching time frame climate they are showing side effects or asymptomatic are as yet infectious. As the sculptures demonstrated most of the grown-up patients were old, who had higher bleakness and case-casualty rate (Niu et al., 2020).

The more seasoned affirmed patients with COVID-19 contamination have a high extent of serious cases, and the COVID-19 disease is by and large powerless with a moderately high casualty rate in more established populace (Niu et al., 2020).

An exploration expressed that the principal passing of COVID-19 disease generally happened in elderly individuals and grew rapidly. Existing examination tracked down that the general casualty pace of contaminated COVID-19 was assessed 2 %–5 %

nonetheless, the case-casualty rate was 8.0 % and 14.8 % in matured 70–79 years and more seasoned than 80 years patients separately (Al-Rohaimi and Al Otaibi, 2020).

In the event of COVID-19 disease in older the examinations found that organization of anti-microbials to forestall contamination and reinforcing of safe help treatment can help in decreasing the case-casualty rate (Al-Rohaimi and Al Otaibi, 2020).

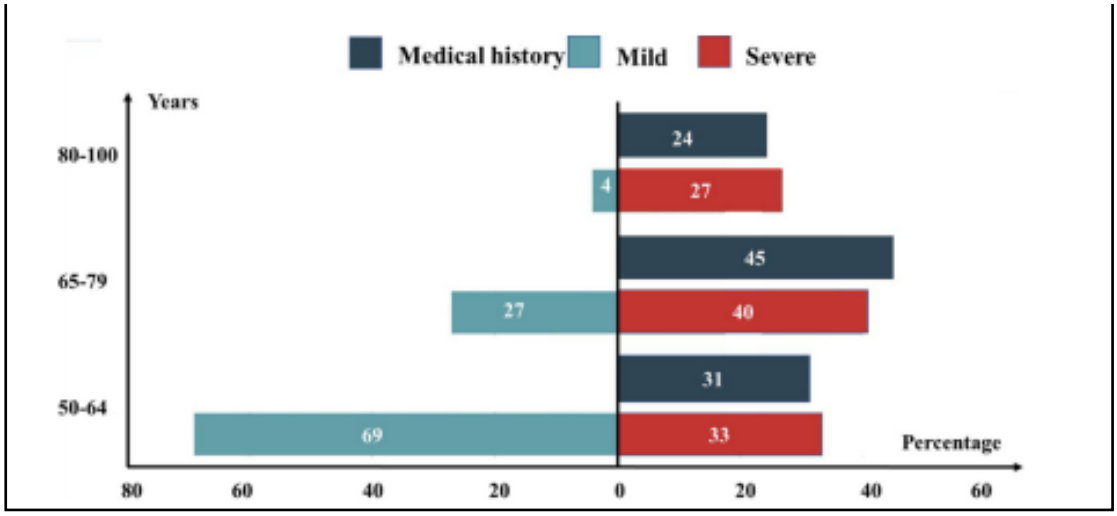


Figure 2. The distribution of mild, severe and medical history after COVID-19 infection by age (Niu et al.,2020).

2.5.2. Pathophysiology of novel SARS-CoV-2

Principally disease happens through drops and airborne that convey novel SARS-CoV-2 and gets connected to the upper respiratory aviation route. The spike proteins of novel SARS-CoV-2 are key particles to interface with the hACE2 receptor and permit viral section to the host cell (Al-Rohaimi and Al Otaibi, 2020).

Novel SARS-CoV-2 is ssRNA infection that catches cell hardware for the replication interaction of RNA. The RNA subordinate RNA polymerase is an essential compound for viral genome replication, then, at that point it collected into new popular particles by cell protein blend system. The epic SARSCoV-2 disease requires at least four days to show manifestations (Al-Rohaimi and Al Otaibi, 2020).

Nonetheless, in an optimal arrangement, 4 to 14 days are the required period for novel SARS-CoV-2 brooding. The side effects in 80% of cases are gentle, while the leftover 20% of cases require clinical consideration (20%). The seriously sick patients require medical care backing like admission to emergency unit and oxygen supply (ventilator) or different sorts of wellbeing support (Al-Rohaimi,a.h. furthermore, Al Otaibi,f. , 2020).

COVID19 patients recuperation relies upon numerous components like age, viral contamination burden, and bleakness hazard factors, and so forth As a defensive measure insusceptible reaction set off on account of extreme disease of novel SARS-CoV-2. Enormous volume of mucous and liquid in alveoli tissue of lungs collected because of cytokine storm as a reaction for novel SARS-CoV-2 disease, this outcome in breakdown of the respiratory framework (Al-Rohaimi and Al Otaibi, 2020).

Up until this point, there is an absence of insusceptibility against novel SARS-CoV-2 disease, and COVID19 stays a constant respiratory condition with a higher level of respiratory disappointment (Al-Rohaimi and Al Otaibi, 2020).

2.5.3. The Risk Factors Associated with Novel SARS-CoV-2 Infection

There are huge varieties in diseases and demise rates everywhere on the world related with novel SARS-CoV-2. Thinking about given information bases from the WHO, CDC, and John Hopkins University, the most basic factor of new SARS-CoV-2 disease is the age. As a rule, the age bunch more prominent than 60 are at higher danger contrast with other age gatherings (Al-Rohaimi and Al Otaibi, 2020). Be that as it may, there is a slight variety in age-related novel SARS-CoV 2 contamination and losses in various populaces (Kretchya et al.,2020)

Second, hazard of novel SARS-CoV-2 contamination and sickness increment because of co-dreariness conditions like diabetes, cardiovascular illnesses, ongoing renal infection, malignancy, and provocative sicknesses. The differential articulation of the hACE2 receptor is the main consideration in novel SARS-CoV-2 contamination, in the

instances of constant obstructive pneumonic sicknesses (COPD) and Asthma conditions populace's disease's danger increment (Al-Rohaimi and Al Otaibi, 2020)

Absence of invulnerability and Malnutrition has an aberrant expansion in COVID19 cases that were accounted for in numerous pieces of the world, particularly in low-pay nations. Notwithstanding, there is an absence of logical information behind ailing health and the ascent of novel SARS-CoV-2 contamination cases (Al-Rohaimi and Al Otaibi, 2020)

These assertions depend on designs announced in different populaces tainted with novel SARS-CoV-2. It is accepted that infections adequately change the host resistant framework and direct specific articulation of quality/s valuable for viral contamination and concealment of the host invulnerable framework (Al-Rohaimi and Al Otaibi, 2020).

2.5.4. Morbidity and Mortality Statistics

As per COVID19 information at the CDC and WHO, the death rate ranges somewhere in the range of 0.3 and 10.0% in various populaces across the globe (Al-Rohaimi and Al Otaibi, 2020) .

The death rate is additionally connected with Ro esteem, and according to ongoing discoveries. The distinction in death rate in different populaces all throughout the planet is the capacity of hazard factors, i.e., bleakness conditions, these grim conditions go about as urgent danger factors for novel SARS-CoV-2 contaminations and COVID19 illness. Italy revealed the most noteworthy mortality on account of COVID19, and according to information from the CDC, over 85% of passings are age bunch for over 75 years (Al-Rohaimi and Al Otaibi, 2020).

The ascent in death rate brought about by novel SARS-CoV-2 contamination is likely because of infections' viable destructiveness framework. Albeit the genome of novel SARS-CoV-2 is 30 kb, yet the compound and proteins are exceptionally viable in causing contamination and infection. This is a characteristic marvel in microorganisms and infections to have powerful and successful proteins/catalysts playing out different undertakings (Al-Rohaimi and Al Otaibi, 2020).

2.5.5. Genome Sequencing of SARS-CoV-2

From Wuhan China in January 11, 2020 data about the principal genome succession was delivered on. In light of the succession data genome of novel SARS-CoV-2 is ssRNA comprise of 30 kb (Al-Rohaimi and Al Otaibi, 2020)

In United States of America, Italy, and India more succession of novel SARS-CoV-2 were accessible with a slight change in hereditary data. In light of the underlying discoveries of four diverse novel SARS-CoV-2 genome successions, it is clear that the infection genome stays unblemished with slight adjustments (Al-Rohaimi and Al Otaibi, 2020)

As indicated by explores discoveries the announced novel SARS-CoV-2 strain in Italy and the United States of America had three particular transformations in RBDs of Spike protein, while it had two varieties in China, and one in India (Al-Rohaimi and Al Otaibi, 2020)

Disease transmission specialists and analysts everywhere on the world began to associate the succession of genome specks of novel SARS-CoV-2 with contamination and death rates. Nonetheless, these discoveries need more clinical information and continued sequencing for approval (Al-Rohaimi and Al Otaibi, 2020).

Preventive and Therapeutic Measures

With respect to now, there is no remedy for COVID19 illnesses, and subsequently avoidance of novel SARS-CoV-2 disease appears to be more helpful as opposed to relying upon vague therapeutics. It is apparent that numerous nations make introductory progress in leveling illness bend during the novel SARS-CoV-2 out of 2019 and 2020, by giving a lot of accentuation on avoidance gauges as opposed to fix.

To break the viral spread numerous nations, for example, South Korea, Taiwan, Australia, and New Zeeland expanded their emphasis on separating people by isolate. Despite what might be expected, nations which deferred to apply preventive techniques

had encountered higher disease and passing rates like United States of America and all significant nations in Europe (counting Italy, Spain, the United Kingdom, France, and Switzerland, and so forth) According to the new report from the WHO (and the CDC) the example of novel SARS-CoV-2 remaining parts comparable; notwithstanding, preventive measures can basically diminish the degree of disease (Al-Rohaimi and Al Otaibi, 2020).

The preventive measures against novel SARS-CoV-2 and COVID19 infection, like lockdown, isolate, contact following and segregation, were first carried out in Wuhan city in China, and it was accounted for to be viable measures. There are numerous preventive measures for security against COVID19 disease, for example, (Oi Lam Ung, 2020):

- Washing hands with water and soap for 20 second minimum or using an alcohol-based (with at least60% alcohol) hand sanitizer (when the hands are not visibly dirty). Washing hands should be multiple times daily specially before eating and after finishing any daily activity.
- Wear a medical mask always when leaving the house (medical mask N95 is the best choice and most protective one.
- Wear a medical gloves and goggles
- Using the elbow or tissue to cover the mouth when coughing or sneezing. In case of using tissue it should be Disposed immediately in a closed bin.
- Don’t touch your eyes, mouth and nose with your hands.
- Keeping the house or work area clean and disinfected
- maintain a distance of about 6 feet (that is how far the particles can travel) between you and any other person in the area
- Avoid the crowded places.

- In case of sickness or experiencing any symptoms call the number that provided by the government for covid19 and stay at home to avoid contact with people and the same goes for a sick family member.

Treatment Options of COVID-19

As of recently there is no particular and viable medication for COVID19, and all restorative intercessions rely upon the seriousness of illness and patients' pathophysiology. The epic SARS-CoV2 disease basically targets hACE2 and taints respiratory aviation route prompting viral pneumonia (Al-Rohaimi and Al Otaibi, 2020).

Utilizing numerous antiviral medications had shown an alternate impact from one case to another. Utilizing antiviral medications for novel SARS-CoV-2 contamination cases isn't general, and as per the accessible outcomes, no single antiviral medication had shown total remedy for COVID19 (Al-Rohaimi and Al Otaibi, 2020).

In light of WHO, 2020 report, numerous antiviral prescriptions, against malarial medication, and insusceptible modulators have been clinically tried to battle COVID19. Still there is an uncertainty for utilizing of 4-aminoquinolines chloroquine (CQ) and hydroxychloroquine (HCQ) for the administration of COVID19 because of the developing toxicological results. Despite the fact that, numerous nations had permitted utilizing HCQ and CQ for seriously sick COVID19 patients and clinical experts who are working in high-hazard regions, since heme polymerase inhibitor for both HCQ and CQ offer some degree of help in viral replication (Al-Rohaimi and Al Otaibi, 2020).

As of late and for the motivations behind COVID19 the board, medications, for example, Tocilizumab a mitigating were supported to be utilized. A few antiviral medications are being tried for COVID19 like Remdesivir, a nucleotide simple. Favipiravir, a RNA polymerase inhibitor, could be an expected medication for COVID19 (Al-Rohaimi and Al Otaibi, 2020).

COVID19 patient recuperation rate relies upon fundamental and basic clinical consideration (emergency unit) aside from helpful mediation. Invulnerable sponsor and insusceptible modulators are fundamental cures on account of COVID19 the board (International Pharmaceutical Federation, 2020)

Drug Development

Medication improvement is muddled and tedious cycle that requires a gigantic exploration endeavors, clinical investigations, and distinctive administrative cycles. Considering epic SARS-CoV-2 pandemic case, much accentuation is given on repurposing the current medications that were tried before in various cases, for example, the instance of SARS-CoV episode in time span 2002 to 2003, and the instance of MERS-CoV flare-up in time-frame 2014 to 2015 (Smith and Prosser, 2020).

Since tale SARS-CoV-2 has a huge similarity with SARS-CoV and MERS-CoV, subsequently there is expanding plausibility to reexamine therapeutics that were tried previously, or to foster another kind of medication by focusing on the infection at various stages. As it is grounded that viral connection and section to human cells happen by ACE2 receptor by fostering a proclivity with viral spike proteins; so we need to expand the accentuation on discovering inhibitors to limit liking among hACE2 and RBDs of spike proteins (Al-Rohaimi and Al Otaibi, 2020).

Up to this point there is no single medication or inhibitor to restrict the RBDs partiality of spike protein and hACE2. The following methodology depends on capturing viral replication by permitting nucleotide simple outcomes use. Remdesevir is a nucleotide underlying simple medication under clinical and trial examination that could be future possible medication for COVID19 the board. The most significant and powerful methods for viral replication control is hindrance of RNA subordinate RNA polymerase, a viral chemical answerable for making duplicates of the viral genome (Al-Rohaimi and Al Otaibi, 2020).

Favipiravir is under clinical investigations as indicated by its wellbeing and viability as polymerase inhibitor for RNA. Numerous protease inhibitors possibly supportive in diminishing cell viral burden by impairing catalyst movement (Smith and Prosser, 2020). The mix of (Lopinavir/ritonavir) is being tried as a protease inhibitor in setting

with COVID19. These are an ascent in the test for mitigating medications, for example, sarilumab and Tocilizumab (Al-Rohaimi and Al Otaibi, 2020).

In light of ebb and flow discoveries, it appears to be that looking for a successful medication to fix COVID19 stays in progress for quite a while. The natural framework approaches and PC supported medication plan (CADD), offer a promising field in present day drug improvement measure

It permits discovering the fondness of medication atoms towards different receptors in the host and choosing the best sub-atomic objective (Al-Rohaimi and Al Otaibi, 2020).

To restrain novel SARS-CoV-2 replications, diverse plant-based medications were analyzed utilizing various focuses. Plant items, for example, lycorine had shown fundamental positive outcomes in lessening the provocative reaction in SARS-CoV. As of late a few phytophenols were tried for antiviral properties and against SARS-CoV also (Al-Rohaimi and Al Otaibi, 2020).

The plant-got from phytophenol and dynamic fixings in tea had shown a wellspring of against SARS-CoV compounds. Mizoribine and Ribavirin in ensuing investigation, have shown an inhibitory impact on novel SARS-CoV-2 replication approved on plaque test

Exploration results have shown that the utilization of nutrients and different supplements are critical for quick recuperation of COVID19 patients Apart from antiviral and immunomodulatory drugs. The clinical investigations have additionally shown that the huge utilization of nutrient C and E are crucial for COVID the executives (Al-Rohaimi and Al Otaibi, 2020).

Vaccine Development

Vaccine is an extreme solution for control illness spread and to give the required resistance against contamination battle for any infectious sickness. On January 11, 2020 novel SARS-CoV2 hereditary succession was distributed and Research Avenue for antibody plans were opened. There is the race for a vaccine against novel SARSCoV-2 and a few are under clinical preliminary investigations. As of early April 2020, there are 78 dynamic undertakings worldwide on vaccine improvement (Al-Rohaimi and Al Otaibi, 2020

Around 73 of them are in the preclinical setting, while not many of them are under clinical preliminaries, for example, mRNA-1273 from Moderna, INO-4800 from Inovio, Ad5-nCoV from CanSino Biologicals, LV-SMENP-DC and microorganism explicit aAPC from Shenzhen Geno-Immune Medical Institute (Al-Rohaimi and Al Otaibi, 2020

Various antigenic/immunogenic triggers are being utilized for the reasons for novel SARS-CoV2 antibody improvement, like constricted infection, non-repeating viral vectors, latent infection, recreating viral vectors, peptides based vaccine, recombinant proteins and hereditary material and so on (Al-Rohaimi and Al Otaibi, 2020

Vaccines advancement needs no less than year and a half given simplicity in administrative cycles; be that as it may, at the current situation where novel SARS-CoV-2 remaining parts a pandemic, the course of events could contrast from routine one. In the race of antibody advancement few examinations have shown that the hereditary varieties in novel SARS-CoV-2 could be a danger factor. Furthermore, tracking down a widespread antibody is basic for handling the worldwide pandemic (Al-Rohaimi and Al Otaibi, 2020)

2.6. Pharmacists and The Pharmacy Workforce Responsibilities

Reduction in the infection rate and outbreak of the disease is a result of corporation between decision-makers, healthcare professionals, the media and the community. As it previously happened in 2003 with SARS-CoV and in 2012 with MERS-CoV, FIB issued new regulations and measurements aiming to help pharmacists and pharmacy workforce in stopping the disease from spread and management in the healthcare system (International Pharmaceutical Federation, 2020).

Professional Oversight/Managing Pharmacist

In the event that the overseeing drug specialist can't guarantee his/her essence and part at the drug store, a second drug specialist who may have a place or not to the drug store's representatives can take these obligations. The second pharmacist must be

responsible for supervising all pharmacy activities including employees (International Pharmaceutical Federation, 2020).

Opening times

In the event that drug store's proprietor can't guarantee the ordinary opening times because of COVID-19 pandemic conditions and staff inaccessibility, the new opening times ought to be explained to public in apparent spot at any rate outside the drug store. The new opening occasions need to guarantee negligible support of the local area as far as medications supply (International Pharmaceutical Federation, 2020)

Patient/Customer Service

To guarantee the proceeds with supply of meds and administrations to individuals where there is just single drug store in a specific span (this case may fluctuate from one country to another), contact with patients/clients ought to be limited by apportioning meds through a little window on the veneer or entryway, similar to those regularly utilized for night administrations. Numerous different procedures can be utilized to limit contact with clients, for example, fixing plastic safeguard before apportioning region, or setting blemishes on ground to demonstrate distance among clients and staff (1-2 meters)

In the event that neither of these actions can be applied, clients ought not permitted to enter the drug store and drug specialists are encouraged to utilize proper individual defensive gear, like veils and goggles, where required. Drug stores overall are additionally encouraged to administer meds through this window at whatever point this might be important to limit contact while guaranteeing coherence of administration. To keep away from individuals swarming inside the drug store, clients ought to be approached to hang tight external the drug store. Additionally, it is significant for the clients to keep a distance of 1–2 meters between one another's while holding up in the line (International Pharmaceutical Federation, 2020)

Drugs Home Delivery

To guarantee the suitable inventory of prescriptions to patients and the general population, particularly in unassuming communities where different drug stores may have shut, open drug stores may put together the home conveyance of medications. Drug stores that can give medication conveyance administration are urged to offer it, particularly for patients in home isolate, or for the individuals who may have a place with high danger gatherings or have versatility limitation

Individual in control for real conveyance should stay away from any immediate contact with patients or their own items. Deliverer can leave meds and different things outside the client's entryway or some other assigned spot. Additionally, he should be careful distance of 1–2 meters and ensuring that prescriptions are gathered by the patient or an approved individual (International Pharmaceutical Federation, 2020)

Public region

Admittance to items on self-choice by clients ought to be limited to keep away from numerous individuals contacting these items; they ought to be gotten to exclusively by drug store faculty (International Pharmaceutical Federation, 2020).

Pharmacists Role in COVID-19 Pandemic

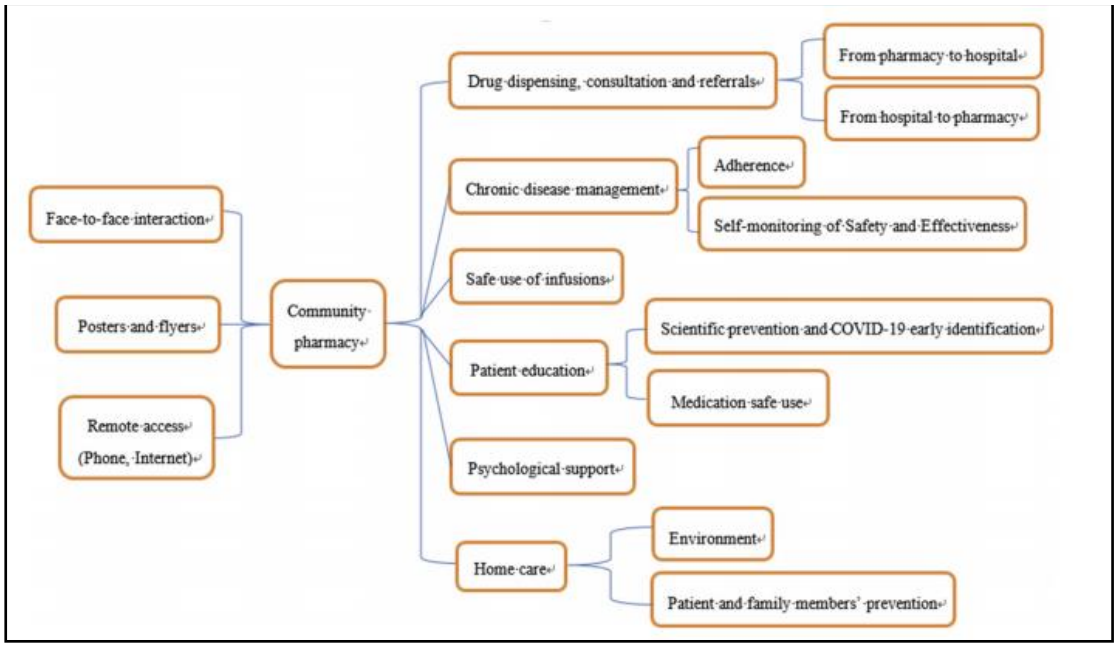


Figure 3. An overview of the recommended content of community pharmaceutical care services during the COVID-19 outbreak (Zhenga et al., 2020).

2.7. The Pharmacist's Role In The Community Pharmacy

Pharmacists as the most open medical care supplier, they can go about as a general wellbeing counsel, pharmacists can assume significant part in expanding local area mindfulness by giving fitting data and advices about prudent steps and offering. Additionally, they are a principle provider for important items, with the goal that they can without much of a stretch empower COVID-19 speculated people and their relatives to wear clinical veils, or to get treatment from medical care offices (Al-Quteimat and Amer, 2020)

Pharmacists ought to know to clients' movement to high-hazard regions and their own contact chronicles. Pharmacists s should educate individuals not suspected regarding having COVID19 to rehearse social removing and to stay away from encased and swarmed spaces, additionally to keep a defensive distance of at any rate 2 meters from people associated with having COVID-19

Pharmacists ought to urge individuals to rehearse ordinary and powerful hand cleanliness, and to exhibit pleasant and less irresistible methods of hacking or sniffling by covering nose and mouth with a flexed elbow or paper tissue, disposing of the tissue following utilizing it's anything but a fitting container, cleaning hands with water and cleanser, and trying not to contact the facial T-zone (mouth, nose, eyes) both when washing their hands (Al-Quteimat and Amer, 2020)

Local area pharmacists can assume a significant part in suggesting side effect the board for gentle conditions, ensuring prescriptions are reordered on time, acquiring protection supersedes for concerned patients and recommending meds for explicit cases, this will decrease pointless clinic visits, where people may be presented to COVID-19. To explain government rules and whatever other data that might be identified with the illness drug stores and drug affiliations can plan data materials for the local area, for example, instant messages, banners, handouts, sites, and application alarms (Al-Quteimat and Amer, 2020)

Following an episode, and for site sterilization purposes SOP prescribe not to utilize the defiled region where the individual was found, keeping the room's entryway shut and windows opened, and to turn off any cooling. We should keep any loss from the

polluted region until the person's test outcomes are known. In the event that an individual is suspected to have COVID-19, and he invested energy in any open regions, like holding up regions or restrooms, then, at that point these regions should be cleaned (Al-Quteimat and Amer, 2020).

Notwithstanding, a few pharmacists have exhorted not to follow a few suggestions identified with disengagement region in local area drug stores. Setting up a disengagement region locally drug store may urge people to introduce at the drug store, accepting that it's anything but a protected spot, this could build the disease hazard for drug store staff. Additionally, setting up segregation region in local area drug stores dependent on SOP proposal would be exorbitant and tedious; this making it's anything but practicable for some drug stores. At long last, local area drug stores should remain open and accessible except if they encouraged to nearby the wellbeing security group (Al-Quteimat and Amer, 2020).

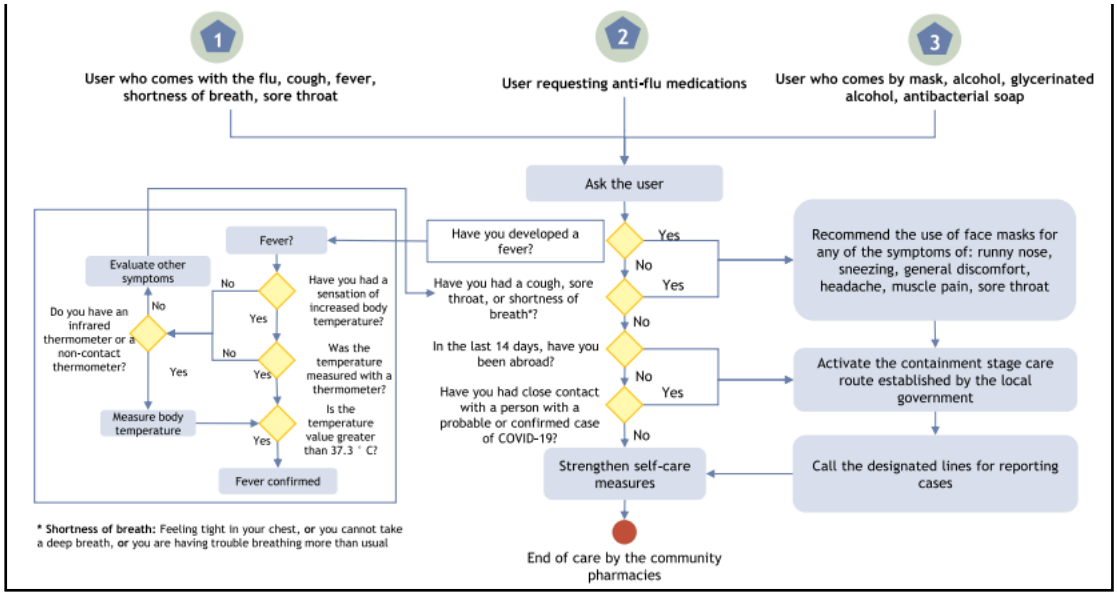


Figure 4. Route of attention of users with suspicion of COVID-19 in the community pharmacies(Pedro Amarileset al.,2020).

2.7.1. The role of clinical and infectious disease pharmacists

Clinical and ID pharmacists should stay up with the latest with all medication related data that might be needed in COVID-19 cases, which may include dosing and portion change, drug/drug collaborations, drug/food cooperations, antagonistic impacts, observing boundaries and the pharmacokinetics of all medications that might be utilized (Al-Quteimat and Amer, 2020)

Local area Pharmacists: On the cutting edge of wellbeing administration against COVID19

The furthest down the line danger to worldwide wellbeing is the continuous episode of Covid-19. The effect on each degree of society has been significant, homegrown and unfamiliar clinical drug specialists teamed up to confront general wellbeing crises, they exploit their therapeutics and pharmacology skill to partake in COVID-19 clinical exercises, and to boost drug specialists' qualities and obligations (Hedima et al., 2020)

In numerous networks, Pharmacists are the principal contact point of patient's with medical care framework, and the most open medical care suppliers. Drug specialists might be the solitary medical services supplier that is promptly available to patients in various regions, for example, rustic and underserved networks and in regions encountering doctor deficiencies. Pharmacists rehearsing in clinics, facilities, doctor workplaces, and local area settings are prepared to treat irresistible illnesses and can fundamentally extend admittance to mind, if hindrances are eliminated (Hedima et al., 2020). During the current pandemic, local area drug stores are frequently perceived to be the primary contact point with medical care framework for people with wellbeing concerns identified with COVID-19 or who require dependable data and guidance (Hedima et al., 2020)

The expansion in medication request could have an extensive and adverse impact on the prescription store network. Drug deficiencies happen when the complete stockpile of a prescription is deficient to satisfy current or projected needs, this issue has been affirmed by various local area drug specialists. Utilizing versatile applications and internet providers drug stores can share data about drug accessibility and its store areas to direct patients once they need to purchase prescriptions. For patients not ready to visit the drug store, mail request or home conveyance administration can be offered by

working with social works, volunteers, care facilitators, or medication organizations (Hedima et al., 2020)

Purpose in care testing

Numerous individuals live in distant region or and a long way from testing area and to make the covid19 testing simpler for them a few drug stores in those spots can go about as testing focuses and can allude patients to clinics when vital (Hedima et al., 2020). Numerous American drug stores began to function as a testing place alongside giving the ordinary drug store administrations and in light of that activity the movement to testing areas has decreased which is a significant relief measure (Hedima et al., 2020)

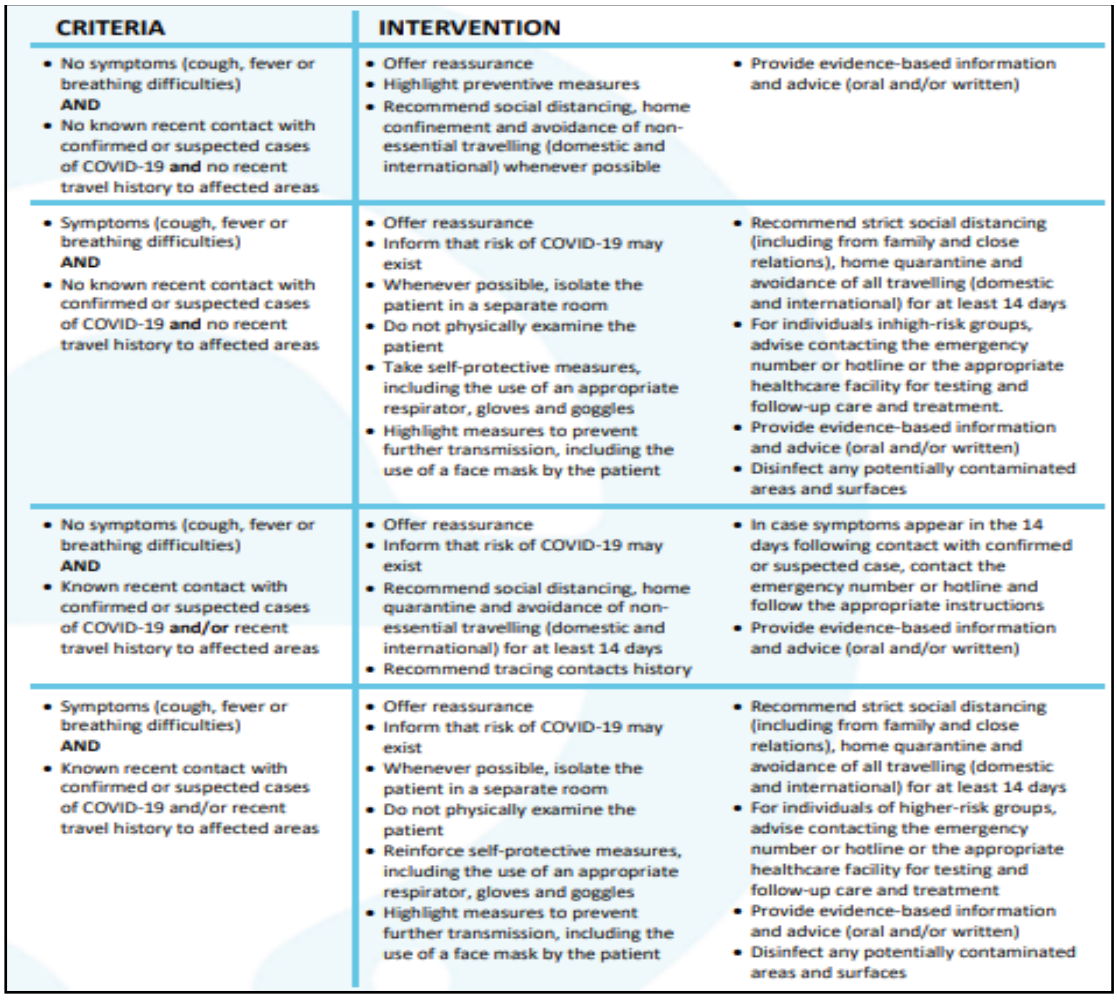
Besides guaranteeing that drug specialists can offer these diagnostics will extend care access in underserved regions, diminish superfluous weight in crisis offices that may as of now be depleted with patients who require more significant level of medical care, it additionally lessen local area openness by taking out pointless office visits, and guaranteeing that patients who need more elevated levels of medical services are alluded to their doctor or clinic for therapy (Hedima et al., 2020)

Overseeing minor afflictions

In spite of all the centering of medical care framework towards the COVID-19 cases and side effects, individuals will likewise keep on creating other non-COVID-19 related manifestations and conditions that require consideration (Hedima et al., 2020). Numerous low keenness conditions (for example normal self-restricting or simple conditions, for example, sensitivities and skin rashes, hacks and colds, and gastrointestinal objections, and a lot more can be clinically evaluated and overseen by local area pharmacists (Cadogana et al., 2020)

Empowering the local area pharmacists to evaluate people who present with specific minor diseases and offer suitable self-care exhortation and treatment alternatives other than endorsing OTC medications and certain doctor prescribed prescriptions from concurred models. Would prompt decrease the related weight of treating these infirmities on significant expense settings, for example, general practice and crisis offices other than diminishing the high chance of getting COVID19 contamination because of the jam-packed clinics (Hedima et al., 2020).

Community pharmacy interventions and patient counselling:



CRITERIA	INTERVENTION	
• No symptoms (cough, fever or breathing difficulties) **AND** • No known recent contact with confirmed or suspected cases of COVID-19 **and** no recent travel history to affected areas	• Offer reassurance • Highlight preventive measures • Recommend social distancing, home confinement and avoidance of non-essential travelling (domestic and international) whenever possible	• Provide evidence-based information and advice (oral and/or written)
• Symptoms (cough, fever or breathing difficulties) **AND** • No known recent contact with confirmed or suspected cases of COVID-19 **and** no recent travel history to affected areas	• Offer reassurance • Inform that risk of COVID-19 may exist • Whenever possible, isolate the patient in a separate room • Do not physically examine the patient • Take self-protective measures, including the use of an appropriate respirator, gloves and goggles • Highlight measures to prevent further transmission, including the use of a face mask by the patient	• Recommend strict social distancing (including from family and close relations), home quarantine and avoidance of all travelling (domestic and international) for at least 14 days • For individuals inhigh-risk groups, advise contacting the emergency number or hotline or the appropriate healthcare facility for testing and follow-up care and treatment. • Provide evidence-based information and advice (oral and/or written) • Disinfect any potentially contaminated areas and surfaces
• No symptoms (cough, fever or breathing difficulties) **AND** • Known recent contact with confirmed or suspected cases of COVID-19 **and/or** recent travel history to affected areas	• Offer reassurance • Inform that risk of COVID-19 may exist • Recommend social distancing, home quarantine and avoidance of non-essential travelling (domestic and international) for at least 14 days • Recommend tracing contacts history	• In case symptoms appear in the 14 days following contact with confirmed or suspected case, contact the emergency number or hotline and follow the appropriate instructions • Provide evidence-based information and advice (oral and/or written)
• Symptoms (cough, fever or breathing difficulties) **AND** • Known recent contact with confirmed or suspected cases of COVID-19 and/or recent travel history to affected areas	• Offer reassurance • Inform that risk of COVID-19 may exist • Whenever possible, isolate the patient in a separate room • Do not physically examine the patient • Reinforce self-protective measures, including the use of an appropriate respirator, gloves and goggles • Highlight measures to prevent further transmission, including the use of a face mask by the patient	• Recommend strict social distancing (including from family and close relations), home quarantine and avoidance of all travelling (domestic and international) for at least 14 days • For individuals of higher-risk groups, advise contacting the emergency number or hotline or the appropriate healthcare facility for testing and follow-up care and treatment • Provide evidence-based information and advice (oral and/or written) • Disinfect any potentially contaminated areas and surfaces

Figure 5. Community pharmacy interventions and patient counseling (Community pharmacy interventions and patient counseling, 2020).

3. METHODOLOGY

3.1. Study design:

This study was a cross-sectional study carried among community pharmacists providing pharmacy services in communities located in North Cyprus. The aim of the study was to assess community pharmacists opinions, concerns, preparedness and experience about the novel COVID-19 pandemic. The study was conducted by handing out a survey to community pharmacists in North Cyprus for a period of 2 months. Each pharmacist has answered the questionnaire individually based on his/her concerns and opinions. The study area has covered all the cities in North Cyprus. The study was conducted in community pharmacies.

The researcher has distributed the survey to pharmacists working in community pharmacy, to conduct the interview, and the answers then arranged electronically by using the Excel program. The questionnaire was developed depends on the literature published by the World Health Organisation, The International Pharmaceutical Federation (FIB) and published articles and other published surveys' in Yemen, Turkey and Syria (WHO, 2020; CDC, 2020; International Pharmaceutical Federation, 2020; Community pharmacy interventions and patient counselling, 2020; Karasnehaet al., 2020; Zaidi et al., 2020; Bahloland Dewey, 2020).

The questionnaire was reviewed by three Near East University academicians who are experts in the clinical pharmacy department and revised by their opinions and comments. A pilot study was conducting on 30 pharmacists in Northern Cyprus after developing the survey. The questionnaire was finalized after the feedback from the 30 community pharmacists. The final survey consists 30 items divided into two parts. The first section was demographic consists of 10 items. The second section contained 20 COVID-19 items. Most of the questions had multiple closed options.

All registered pharmacists working at community pharmacies in North Cyprus were invited to participate in the study. The questionnaire was delivered by the investigators to each community pharmacist and it was provided in the Turkish Language. It was translated into the Turkish language by the Near East University academicians using a forward-backwards translation method. The survey was completed at an estimated time of 10 minutes. The researcher had the study aim and confidentiality statement verbally explained to them and asked to sign an approved consent form assigned from the IRB of Near East University. The criteria for participants enrolment were listed below:

Inclusion Criteria:

- Registration as a pharmacist in the North Cyprus.
- Working in a community pharmacy across North Cyprus.

Exclusion Criteria:

- Fully unanswered questionnaires.

3.2. Data Analysis

The SPSS package version 23 was used to analyse the data. The minimum representative sample size is 173 and was calculated using Raosoft sample size calculation software. Descriptive statistics of continuous and categorical variables were calculated. For categorical variables, frequency and percentage were calculated such as age gender and location, while for quantitative variables arithmetic mean, standard deviation, median, minimum and maximum values were given such as attitude and knowledge scores. Since the data did not support parametric assumptions after applying the Kolmogorov-Smirnov test, the Kruskal–Wallis test and the Mann–Whitney U test were performed when applicable. The level of significance of the association between variable was set at a P-value of .05 or less. Ethical approval was obtained from the Institutional Review Board (IRB) of Near East University. All collected data were stored in a password-protected file accessible only to the researchers. The study results were reported as de-identified data and the privacy of the participants was assured during the study with no personal data was revealed.

4. RESULTS

Demographics of Respondents

Three hundred two survey instruments were distributed to community pharmacies in Northern Cyprus. The survey was distributed in two stages due to quarantine and curfew, first level we got 102 survey an after two months we repeated the distribution and completed to 173 surveys. One hundred seventy three (59.6%) pharmacists completed the survey instrument. Most of the respondents were females (121, 69.9%) while males were (52, 30.1%). Age distribution of respondents showed that (112, 64.7%) of the pharmacists are less than 30 years old, between 30-39 years old was (33, 19.1%). Most of the respondents were from Northern Cyprus (165, 95.4%), and (80, 46.2%) had a bachelor degree. The majority of the respondents had less than 5 years' experience (100, 57.8%), while (19, 10.9%) pharmacists had more than 20 years' experience. Northern Cyprus was the country of the study for (114, 65.9%) pharmacist while the remaining pharmacist studied in Turkey and Europe countries. Table 1.

Table 1. Demographic Data of Respondents

Characteristics	**(N=173)**	**Percentage Respondents %**
Gender		
Male	52	30.1
Female	121	69.9
Age		
<30	112	64.7
30-39	33	19.1
40-50	18	10.4
>50	10	5.8
Years of Experience		
<5	100	57.8
6 to 10	39	22.5
11 to15	13	7.5

16 to 20	2	1.1
>20	19	10.9
School location		
North Cyprus	114	65.9
Turkey	39	22.5
Europe	20	11.6
Education		
Bachelor	80	46.2
Master	75	43.4
PhD	18	10.4
Nationality		
Northern Cyprus	165	95.4
Turkey	2	1.2
Others	6	3.5

Related to corona virus disease, our respondents diverse, (115, 66.5%) didn′t get any type of education or training related to the pandemic while (58, 33.5) trained. and for wearing N95 mask during their duties, (42,24.3%) always wear a mask, (25, 14.5%) usually wear a mask, (44, 25.4%) sometimes wear a mask and (62,35.8%) never wear a mask.

Pharmacist role in the pandemic

Out of our respondents, (67, 38.7%) pharmacist always follow any protocol to deal with the covid-19 patients, while only (18, 10.4%) never follow any protocol. In our enrolled sample (45, 32.4%) pharmacist believe that Pharmacists sometimes should be involved in conducting mass vaccination clinics and be called upon to assist at non-traditional sites (e.g., community centres, schools, Homes) during this covid-19 pandemic and (34, 19.7%) never believed that. Out of the enrolled sample (91, 52.6%) always think it′s

the pharmacist role to create a balance between supply and demand of medicines and consumables and provide the main medications during covid-19 pandemic and only (6, 3.5%) never think that. Out of enrolled pharmacists, (64, 37.0%) pharmacists always should be authorised to repeat dispensing of prescribed medicines for patients with long-term conditions, to reduce the need for medical appointments and release resources and only (15,8.7%) pharmacists never think that.

Table 2. Pharmacist role in pandemic

Items	**Always N(%)**	**Usually N(%)**	**Sometimes N(%)**	**Never N(%)**
Do you follow any protocol to deal with the covid-19 patients or suspected patients in your pharmacy?	**67 (38.7%)**	50 (28.9%)	38 (22%)	18 (10.4%)
Do you Pharmacists should be involved in conducting mass vaccination clinics and be called upon to assist at non-traditional sites (e.g., community centeres, schools, Homes) during this covid-19 pandemic?	45 (26.0%)	38 (22.0%)	**56 (32.4%)**	34 (19.7%)
Do you think it's the pharmacist role to create a balance between supply and demand of medicines and consumables and provide the main medications during covid-19 pandemic?	**91 (52.6%)**	51 (29.5%)	25 (14.5%)	6 (3.5%)
Do you think the pharmacist should be authorized to repeat dispensing of prescribed medicines for patients with long-term conditions, to reduce the need for medical appointments and release resources?	**64 (37.0%)**	47 (27.2%)	47 (27.2%)	15 (8.7%)

To assess the difference between demographic groups, appropriate statistical analysis was performed, the results showed that the female have insignificant higher (mean ± SD) for the score than males pharmacists (11.76 ±2.30) (11.63 ±2.57) ($p > 0.05$), respectively.The results showed that the pharmacists with 6-10 years of experience have insignificant higher (mean ±SD) for the score than the other experience groups

(p > 0.05), respectively. The table demonstrated that pharmacists who had a training course related to pandemic have significantly higher (mean ±SD) compared to who didn′t get any training course (12.29±2.63)(11.46±2.38) (p = 0.04).

Table 3. Role of pharmacist as a total score with respect to demographic characteristics

	Mean±SD	**P-value**
Gender		
Male	11.63± 2.57	0.81
Female	11.78± 2.30	
Age		
<30	11.53± 2.32	0.25
30-39	12.15± 2.75	
40-50	12.70± 2.40	
>50	11.72± 2.32	
Experience		
<5	11.49± 2.29	0.37
6-10	12.32± 2.62	
11-15	11.79± 2.68	
>20	11.70± 2.25	
Education		
Bachelor	11.61± 2.13	0.63
Master	11.94± 2.45	
PhD	11.44± 3.11	
Study Country		
Northern Cyprus	11.74± 2.35	0.98
Turkey	11.76± 2.53	
Europe	11.65± 2.32	

Receiving Training Course Related to COVID-19		
Yes	12.29± 2.36	**0.04***
No	11.46± 2.38	

What is your source of information about COVID-19 virus?		
	N	**(%)**
TV and newspapers	61	35.3
Hospitals posters and brochures	14	8.1
Doctors and health staff	7	4.0
Social media	44	25.4
WHO	148	85.5
Work colleagues	12	6.9
Consulting the people if they felt any COVID-19 symptoms.		
Telling family or friends	14	8.1
Buying drugs like Hydroxychloroquine	0	0.0
Vitamins	35	20.2
Go to hospitals	130	75.1
Call COVID-19 numbers provided by governments	116	67.1
Stay at home and quarantine yourself	64	37
Measures to maintain social distancing in the pharmacy		
Put up signs telling people to keep their distance	134	77.5
Install Perspex or plexiglass screens to provide a physical barrier	93	53.8
Create ‘Do Not Cross’ lines or barriers (both front of counter and behind the counter) – we’ve seen examples using tape, portable signs, temporary barriers, chairs facing outwards	80	46.2

Limit the number of people in the pharmacy; by closing doors or have staff at the doors controlling entry and exit	102	59
Provide gel for the public to use when entering and leaving	141	81.5
Use floor markers/spacers to indicate two meter distances to help with social distancing	95	54.9
Advise the people to protect them against the covid-19 infection		
Staying at home	121	69.9
Don't go to crowded places	158	91.3
Wash your hands with water and soap keep hygiene	156	90.2
Advise patients to avoid long stays in the pharmacy	78	45.1
Advise the patients not to visit pharmacy if they have comorbidity diseases or they are elderly	116	67.1
Use hand sanitizers	152	87.9
Wear gloves	42	24.3
Wear medical muzzle	146	84.4
Vitamins	122	70.5
Social distance	153	88.4
Drinking hot water every 15 min	23	13.3
Gargle with salt water	35	20.2
Measures you take to reduce the risk of transmission for staff		
Train staff on hand washing and new policies	151	87.3
Make sure staff regularly washes hands after handling prescriptions, dispensing phone…etc	138	79.8
Regularly clean surfaces including counters, chairs, door handles, stationary,..etc	142	82.1

Use eye protection when provide patient care services or when got in contact with symptomatic patients	93	53.8
Use one time gloves and throw it out after each transaction and after cashing up	67	38.7
Pharmacy teams do NOT need to wear facemasks, except in high risk situations if a person showing symptoms of COVID-19 enters the pharmacy	16	9.2
Monitor the health of your team. Send them home if they feel unwell and Follow the stay at home guidance if a member of your team has symptoms or is living with someone in self-isolation	62	35.8
Keep 1-2 meter distance between the stuff and the patients and between the stuff themselves in the pharmacy	110	63.6
Provide a nylon or glass barrier between the pharmacists and the patients	74	42.8
Keep the patients out of the pharmacy and provide the services at the pharmacy door	62	35.8
Best way to stop the transmission of COVID-19 virus		
Start to use drugs like hydroxychloroquine or other drugs as a preventive treatment	7	4.0
Provide free tests for all regardless if there are symptoms or not	152	87.9
Put people at high risk like elderly and children under restrict rules and measures.	111	64.2
By using herd immunity mechanism(while quarantine elderly and children the rest continue their life normally)	19	11.0
Influenza vaccines	22	12.7

More than one answer can be selected (percentage summation≠100)

Related to the source of information, the majority of the participant choose WHO as the source they use it to obtain information (148, 85.5%), for the best way to stop the transmission of the pandemic most of the enrolled sample suggest to provide free tests for everyone regardless if they have symptoms or not (152, 87.9%).

Regarding the measures should be taken to protect the staff from infection most of the sampled suggested to regularly clean surfaces including counters, chairs, door handles, stationary, etc. (142,82.1%), avoiding crowded places and keep hygiene and washing hands were the most advisable statement the enrolled sampled provided to the patients(158,91.3%)(156,90.2%), respectively.

5. DISCUSSION

Pharmacists have a huge part in fighting the spread of Corona infection. Likewise for being liable for giving protected and compelling treatment, particularly in pandemics, (Liu S et al.,2020). They could give refreshed data about the infection, improve public mindfulness about how hazardous and genuine is COVID-19, select proof based meds and give drugs and cleanliness items which could help in disease avoidance and control

Thusly, it is important to graduate pharmacists with improved information and mindfulness, and subsequently the capacity to oversee potential pandemics, for example, COVID-19, particularly if the infection flare-ups proceed and the requirement for viable drug care intercessions turns into a worldwide interest (Erku DA, et al., 2020). The current investigation is the first to assess pharmacists convictions about COVID-19 and their job in Northern Cyprus

In the current investigation, the members by and large utilized the WHO, TV, and online media as assets. The wellspring of data that the members used to find out about COVID-19 contamination impacted their insight into and mentalities towards COVID-19 disease

The members that utilized the WHO as a data source had the right methodologies particularly in activities for insurance from the infection (like washing hands and preparing the staffs for washing hands). The members that got data from work associate additionally had the right methodologies concerning security from the infection (like washing hands and wearing veils and gloves in the drug store). Our discoveries were in accordance with an examination completed in turkey, this closeness came from that the asset of data utilized is influencing the mentalities and convictions of the members in regards to their job.(Emre, K. A. et al .,2020).

In an study led in Egypt discovered such quinine-based antimalarial medications, for example, Chloroquine and its subsidiaries suggested in 39.1% of drug stores, an immediate aftereffect of frenzy purchasing because of the pandemic, while interestingly with our discoveries, just 4.0% of the pharmacists s suggested. This brought about a deficiency of the medications for the treatment of other immunological conditions like rheumatoid joint pain and lupus, notwithstanding that these kinds of medications are nor suggested anything else for COVID-19. (Bahlol, M., and Dewey, R. S. 2020)

Overall, the participants of our study have a positive belief about their role in the pandemic, and significant difference was found between who had a training course and who didn't, this difference reflecting the importance of such courses and these courses should be implemented in the curriculum of pharmacy degree or should be as a mandatory to renew the pharmacist accreditation practice. These findings was opposite to study conducted in Turkey and this difference due to low number of who participated in the courses in that study (2,0.8) .(Emre, K. A. et al .,2020)

Strengths and limitations

Obtaining 173 responses out of the distributed questionnaires could be considered as good response rate for this study specially in the pandemic situation, this number forming more than 50% of total licensed pharmacists in Northern Cyprus can be also considered as a reflective sample size.

A second strength of this study is that the surveyed pharmacists included those of all major cities in North Cyprus: Lefkosa, Magusa and Kyrenia, Omrofo, Lefke.

An expert translated the questionnaire from English into Turkish and health professional who is familiar with the terminology of the area covered by the survey,

then it was sent to two independent Turkish native speaker expert in translation, they translated the questionnaire backward into English to maintain equivalence of the test questionnaire in the target language.

Drug specialists who take part in the study by and large were positive toward their job in the pandemic, yet additionally drug specialists who were not able to take part may have had various perspectives, particularly those of more seasoned ages since larger part of responders were youthful or moderately aged.

There was no wide scope of minor departure from drug specialist react perhaps because of close maturing and encounters additionally an inquiry ought to be posed to whether the uplifting outlooks and practice claims match with the truth of drug store practice in Northern Cyprus, which could be additionally concentrated with better target instruments.

Another limit of the examination that the study directed distinctly to local area drug specialists in NC and other medical care supplier (doctors and attendants) ought to be incorporated to see the hole between medical care suppliers and their work on during the pandemic.

Since COVID-19 is another pandemic, there is an expanded potential for the commonness of deceiving data about this pandemic.

6. CONCLUSION

Participants believed that pharmacists have a vital role in COVID-19 pandemic but also have some fears and should the pharmacy association regularly improve pharmacist knowledge and improve the pharmaceutical care practice to involve the pharmacists in pandemic controlling. Results of this study have important international applicability, as pharmacists all over the world share similar fears while being obliged to perform their responsibilities and engage with public society. Also the findings support the needing to improve the pharmacist's knowledge and the using of trusted and reliable resources for information in such a pandemic.

7. REFERENCES

Al-Rohaimi, A. H., & Al Otaibi, F. (2020). Novel SARS-CoV-2 outbreak and COVID19 disease; a systemic review on the global pandemic. *Genes & diseases*.

Amariles, P., Ledezma-Morales, M., Salazar-Ospina, A., & Hincapié-García, J. A. (2021). How to link patients with suspicious COVID-19 to health system from the community pharmacies? A route proposal. *Research in Social and Administrative Pharmacy*, *17*(1), 1988-1989.

Bahlol, M., & Dewey, R. S. (2021). Pandemic preparedness of community pharmacies for COVID-19. *Research in Social and Administrative Pharmacy*, *17*(1), 1888-1896.

Bahlol, M., & Dewey, R. S. Pandemic preparedness of community pharmacies for COVID-19: A cross-sectional survey. *Research in Social & Administrative Pharmacy*.

Basheti, I. A., Nassar, R., Barakat, M., Alqudah, R., Abufarha, R., Mukattash, T. L., & Saini, B. (2020). Pharmacists' readiness to deal with the coronavirus pandemic: assessing awareness and perception of roles. *Research in Social and Administrative Pharmacy*.

Bradley, M. (2020). The Essential Guide to The Wuhan Virus (Symptoms, Transmission and Prevention). *Corona Virus*, *2*.

Cadogan, C. A., & Hughes, C. M. (2021). On the frontline against COVID-19: Community pharmacists' contribution during a public health crisis. *Research in Social and Administrative Pharmacy*, *17*(1), 2032-2035.

Canadian Pharmacists Association. (October 2009). Pandemic influenza: a pharmacists guide to Pandemic preparedness.

Community pharmacy interventions and patient counseling. (26 March 2020). International Pharmaceutical Federation website. https://www.fip.org/coronavirus

Corona virus disease (covid19).(17 January 2020). Center for disease control and prevention website: https://www.cdc.gov/coronavirus/2019-nCoV/index.html

Coronavirus disease (COVID-19) pandemic. (2020). World Health Organization. https://www.who.int/health-topics/coronavirus#tab=tab_1

Emre, K. A. R. A., Demirkan, K., & Serhat, Ü. N. A. L. (2020). Knowledge and attitudes among hospital pharmacists about COVID-19. *Turkish journal of pharmaceutical sciences*, *17*(3), 242.

Erku, D. A., Belachew, S. A., Abrha, S., Sinnollareddy, M., Thomas, J., Steadman, K. J., & Tesfaye, W. H. (2021). When fear and misinformation go viral: Pharmacists' role in deterring medication misinformation during the'infodemic'surrounding COVID-19. *Research in Social and Administrative Pharmacy*, *17*(1), 1954-1963.

Hedima, E. W., Adeyemi, M. S., & Ikunaiye, N. Y. (2021). Community pharmacists: on the frontline of health service against COVID-19 in LMICs. *Research in Social and Administrative Pharmacy*, *17*(1), 1964-1966.

Hickok, K. (2020). March 13). What is a pandemic? Reference article: Definition and examples of a pandemic. Retrieved from https://www.livescience.com/pandemic.html

International Pharmaceutical Federation. (26 march 2020). COVID-19: Guidlines for pharmacists and pharmacy workface

International Pharmaceutical Federation. (26 MARCH 2020). COVID-19: CLINICAL INFORMATION AND TREATMENT GUIDELINES

International Pharmaceutical Federation. (26 MARCH 2020). FREQUENTLY ASKED QUESTIONS AND MYTH BUSTING

International Pharmaceutical Federation. (26 MARCH 2020). Treatment guidelines and medicines to be stocked

Karasneh, R., Al-Azzam, S., Muflih, S., Soudah, O., Hawamdeh, S., & Khader, Y. (2021). Media's effect on shaping knowledge, awareness risk perceptions and communication practices of pandemic COVID-19 among pharmacists. *Research in Social and Administrative Pharmacy*, *17*(1), 1897-1902.

Kretchy, I. A., Asiedu-Danso, M., & Kretchy, J. P. (2021). Medication management and adherence during the COVID-19 pandemic: perspectives and experiences from low-and middle-income countries. *Research in social and administrative pharmacy*, *17*(1), 2023-2026.

Li, H., Zheng, S., Liu, F., Liu, W., & Zhao, R. (2020). Fighting against COVID-19: innovative strategies for clinical pharmacists. *Research in Social and Administrative Pharmacy*.

Liu, S., Luo, P., Tang, M., Hu, Q., Polidoro, J. P., Sun, S., & Gong, Z. (2020). Providing pharmacy services during the coronavirus pandemic. *International journal of clinical pharmacy*, *42*(2), 299-304.

Morens, D. M., & Fauci, A. S. (2020). Emerging pandemic diseases: How we got to COVID-19. *Cell*.

Nicola, M., O'Neill, N., Sohrabi, C., Khan, M., Agha, M., & Agha, R. (2020). Evidence based management guideline for the COVID-19 pandemic-Review article. *International Journal of Surgery*.

Niu, S., Tian, S., Lou, J., Kang, X., Zhang, L., Lian, H., & Zhang, J. (2020). Clinical characteristics of older patients infected with COVID-19: A descriptive study. *Archives of gerontology and geriatrics*, *89*, 104058.

Ph, A. M. A. R. (2021). SARS-CoV-2 outbreak: how can pharmacists help?. *Research in Social and Administrative Pharmacy*, *17*(2), 480-482.

Rubin, S. E., Schulman, R. M., Roszak, A. R., Herrmann, J., Patel, A., & Koonin, L. M. (2014). Leveraging partnerships among community pharmacists, pharmacies, and health departments to improve pandemic influenza response. *Biosecurity and bioterrorism: biodefense strategy, practice, and science*, *12*(2), 76-84.

Sarkar, C., Mondal, M., Torequl Islam, M., Martorell, M., Docea, A. O., Maroyi, A., ... & Calina, D. (2020). Potential therapeutic options for COVID-19: current status, challenges, and future perspectives. *Frontiers in pharmacology*, *11*, 1428.

Semple, S., & Cherrie, J. W. (2020). COVID-19: protecting worker health.

Seymor,t. , schulman,j.s. (15 january 2018). Types of zoonosis diseases. Medical news today. https://www.medicalnewstoday.com/articles/320618#what-is-zoonosis

Silveira, M. M., Moreira, G. M. S. G., & Mendonça, M. (2020). DNA vaccines against COVID-19: Perspectives and challenges. *Life sciences*, 118919.

SteelFisher, G. K., Benson, J. M., Caporello, H., Koonin, L. M., Patel, A., Ben-Porath, E., & Blendon, R. J. (2018). Pharmacist views on alternative methods for antiviral distribution and dispensing during an influenza pandemic. *Health security*, *16*(2), 108-118.

Ung, C. O. L. (2020). Community pharmacist in public health emergencies: Quick to action against the coronavirus 2019-nCoV outbreak. *Research in Social and Administrative Pharmacy*, *16*(4), 583-586.

Wells,d. , walash,k.t. (20 July 2020). Zoonosis. Healthline. https://www.healthline.com/health/zoonosis

Zaidi, S. T. R., & Hasan, S. S. (2021). Personal protective practices and pharmacy services delivery by community pharmacists during COVID-19 pandemic: Results from a national survey. *Research in Social and Administrative Pharmacy*, *17*(1), 1832-1837.

Zheng, S. Q., Yang, L., Zhou, P. X., Li, H. B., Liu, F., & Zhao, R. S. (2020). Recommendations and guidance for providing pharmaceutical care services during COVID-19 pandemic: a China perspective. *Research in social and administrative pharmacy*.

8. APPENDIXES

SURVEY

Section 1: Demographic

1. Gender?

☐ **Male**

☐ **Female**

2. Age?

☐**<30 years**

☐ **30-39 years**

☐ **40-50 years**

☐**>50 years**

3. Nationality?

☐**Republic of north Cyprus**

☐**Republic of Turkey**

☐**Others (……)**

4. Academic Qualification:

☐**Bachelor degree**

☐ **Master degree**

☐**PhD**

☐**Others)**

5. Experience?

☐**<5 years**

☐ **6-10 years**

☐**11-15 years**

☐ **16-20 years**

☐**>20 years**

6. Where did you study?

☐ **Republic of north Cyprus**

☐ **Republic of Turkey**

☐**Europe**

☐**USA**

☐**Others (……)**

7. How many hours do you work daily?

☐**<20 hours**

☐ **20-39 hours**

☐ **40-59 hours**

☐ **60-79 hours**

☐**>80 hours**

8. Where is the pharmacy location?

☐ **Guzelyurt**

☐ **Girne**

☐ **Gazimagusa**

☐ **Lefkosa**

☐ **Lefke**

☐ **İskele**

☐ **Alt-Üst Meserya**

9.How busy is your usual day in the pharmacy during covid-19 pandemic?

☐**Calm**

☐Calm with busy times

☐Normal

☐Busy with calm times

☐Busy

10. Did you receive any education about COVID 19?

☐Yes

☐ No

Sections 2: COVID 19

1. What is your source of information about covid-19 virus?

- **TV and newspapers**
- **Hospitals posters and brochures**
- **Doctors and health stuff**
- **Social media**
- **WHO**
- **Work colleagues**

2. Do you wear a medical muzzle N95 during the contact which the patients?

- **Always**
- **Usually**

- **Sometimes**
- **Never**

3.What do you consult the people if they felt any covid-19 symptoms? (You can choose more than one answer)

- **Tell family and friends**
- **Buy drugs like hydroxychloroquine**
- **Vitamins**
- **Go to the hospital**
- **Call the covid-19 numbers provided by the government**
- **Stay at home and quarantine yourself**
- **Others:**

4. How do you advise the people to protect them against the covid-19 infection? (You can choose more than one answer)

- **Stay at home**
- **Don't go to crowded places**
- **Wash your hands with water and soap and keep hygiene's**
- **Advise patients to avoid long stays in the pharmacy**
- **Advise patients to avoid visiting the pharmacy if they are elderly or have co-morbidities. and such patients should ask a family member or a friend to go to the pharmacy instead of them**
- **Use hand sanitizers**

- **Wear gloves**
- **Wear medical muzzle**
- **Vitamins**
- **Social distance**
- **Drinking hot water every 15 min**
- **Gargle with salt water**
- **Others:**

5. Do you think the pharmacies should work in 24/7 in covid-19 pandemic situation?

- **Yes**
- **No**
- **I don't know**

6. What are the Measures to maintain social distancing in the pharmacy? (You can choose more than one answer)

- **Put up signs telling people to keep their distance**
- **Install Perspex or plexiglass screens to provide a physical barrier**
- **Create 'Do Not Cross' lines or barriers (both front of counter and behind the counter) – we've seen examples using tape, portable signs, temporary barriers, chairs facing outwards**
- **Limit the number of people in the pharmacy; by closing doors or have staff at the doors controlling entry and exit**

- **Provide gel for the public to use when entering and leaving**
- **Use floor markers/spacers to indicate two meter distances to help with social distancing**
- **Others:**

7. Do you suggest that the pharmacies should do a Delivery services?

- **Yes**
- **No**
- **maybe**

8. What are the measures you take to reduce the risk of transmission – for staff? (You can choose more than one answer)

- **Train staff on hand washing and new policies**
- **Make sure staff regularly washes hands after handling prescriptions, dispensing (including compliance aids), touching pens, door handles, phones and after interacting with people, as well as after eating, etc.**
- **Regularly clean surfaces, including counters, chairs, door handles, stationery, phones, keyboards, mouse, tills, staff eating areas, etc.**
- **Use eye protection when provide patient care services or when got in contact with symptomatic patients**
- **use one time gloves and throw it out after each transaction and after cashing up**

- **Pharmacy teams do NOT need to wear facemasks, except in high risk situations if a person showing symptoms of COVID-19 enters the pharmacy**

- **Monitor the health of your team. Send them home if they feel unwell and Follow the stay at home guidance if a member of your team has symptoms or is living with someone in self-isolation**

- **Keep 1-2 meter distance between the stuff and the patients and between the stuff themselves in the pharmacy**

- **Provide a nylon or glass barrier between the pharmacists and the patients**

- **Keep the patients out of the pharmacy and provide the services at the pharmacy door.**

9. If a customer comes to buy a flu drugs should the pharmacist take his information and report it?

- **Yes**

- **No**

- **I don't know**

10. Do you think the rules that taken to help the pharmacies in north Cyprus in covid-19 pandemic are suitable?

- **Yes its good**

- **No they can do better**

- **I don't know**

11. Do you think Pharmacy staff should be encouraged to educate all customers about hand hygiene, infection prevention and control strategies as instructed by the government?

- **Yes**
- **No**
- **I don't know**

12. Do you think working in the pharmacy increase your concern about getting the covid-19 infection?

- **Yes**
- **No**
- **I don't know**

13. Do you think the pharmacists should have received training programs on mental health care to support people during pandemics such as covid-19?

- **Yes**
- **No**
- **I don't know**

14. What do you think is the best way to stop the transmission of covid-19 virus? (You can choose more than one answer)

- **Start to use drugs like hydroxychloroquine or other drugs as a preventive treatment.**
- **Provide free tests for all regardless if there are symptoms or not.**

- **Put people at high risk like elderly and children under restrict rules and measures.**
- **By using herd immunity mechanism(while quarantine elderly and children the rest continue their life normally)**
- **Influenza vaccines**

15. In this pandemic situation do you think it's better if the pharmacies work in shifts (one pharmacy open in each neighborhood and it change daily)?

- **Agree**
- **Not agree**
- **Natural**

16. Do you tend to manage patients with mild illness so that they do not need to access the overburdened acute care settings during covid-19 pandemic?

- **Yes**
- **No**
- **Sometimes**

17. Do you follow any protocol to deal with the covid-19 patients or suspected patients in your pharmacy?

- **Always**
- **Usually**
- **Sometimes**
- **Never**

18. Do you Pharmacists should be involved in conducting mass vaccination clinics and be called upon to assist at non-traditional sites (e.g., community centeres, schools, Homes) during this covid-19 pandemic?

- **Always**
- **Usually**
- **Sometimes**
- **Never**

19. Do you think it's the pharmacist role to create a balance between supply and demand of medicines and consumables and provide the main medications during covid-19 pandemic?

- **Always**
- **Usually**
- **Sometimes**
- **Never**

20. Do you think the pharmacist should be authorized to repeat dispensing of prescribed medicines for patients with long-term conditions, to reduce the need for medical appointments and release resources?

- **Always**
- **Usually**
- **Sometimes**
- **Never**

2. CV

Name	MAHER	Surname	RAHIMA
Place of birth	United Arab Emirates	Date of birth	25-01-1996
Nationality	Syria	Tel	00905428758978
Email	Maherrah393@yahoo.com		

Education Level

	Name of the Institution where he/she was graduated	Graduationyear
Postgraduate/ Specialization	_	_
Masters	NEU	2020
Undergraduate	NEU	2018
High school	Privet Modern	2013

Job experience

Duty	Institution	Duration (Year-Year)
Clinical Pharmacists trainee	NEU hospital	2019

Foreign Language	Reading Comprehension	Speaking	Writing
Arabic	Very good	Very good	Very good
English	Very good	Very good	Very good
Turkish	Good	Good	Good

Foreign Language Examination Grade								
YDS	ÜDS	IELTS	TOEFL IBT	TOEFL PBT	TOEFL CBT	FCE	CAE	CPE

	Math	Equally weighted	Non-math
ALES Grade			
Other grade			

Computer Knowledge

Program	Use proficiency
Microsoft office	Very good
SPSS	Good