

Emerging pharmacy services; Recommendations for emergency care of COVID-19 pandemic in low and middle-income countries

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Abstract: The ongoing outbreak of coronavirus diseases (COVID-19) has been declared as Pandemic by the World Health Organization and now become a global health emergency. Low and Middle income-countries lack standard pharmacy services in terms of staff, education, training, pharmaceutical care, research, and practice. The literature aimed to provide emerging pharmacy services and recommend it to be implemented in low and middle-income countries. Currently, pharmacies were easily accessible sites by the community, a trained staff under the guidance of pharmacist can be helpful for the management of visiting customers. In the surge of disease, pharmacists proved themselves as a frontline defense for the community by significant contribution in identifying, reporting, and managing COVID-19 patients through pharmaceutical care services at the community level, hospital/clinical level, and through Tele-pharmaceutical services.

Keywords: Innovative Pharmacy Practices, Low and middle-income countries, Recommendations for COVID-19,

INTRODUCTION

Rapid emergence and dramatic changes in the ongoing COVID-19 pandemic results in a burden on the healthcare system. According to literature, low and middle-income countries (LMIC's) lack standard pharmacy services in terms of staff, education, training, pharmaceutical care, research, and practice (Hamid *et al.*, 2020). Keeping in view the scenario of an ongoing public health crisis, pharmacists need to play a significant role by delivering pharmaceutical care services as pharmacovigilance and pharmacotherapy plan to COVID-19 patients. In current literature, it was tried to highlight the emerging role of pharmacists in emergency care and recommend them to be implemented in LMIC's (fig. 1).

Community pharmacy services

Community pharmacists have a significant role in preventing the spread of the COVID-19. They are entrusted with vital responsibilities to monitor, advise, and educate the community, maintain a secure supply of pharmaceuticals and personal hygiene products, and screen suspicious cases and make appropriate referrals as needed. As this or similar circumstances develop, community pharmacists will remain involved in the collaborative efforts and respond readily to the changes expected in pharmacy practice. For pharmacists to take on a role in community-level health emergency resilience and response strategies, it has been shown that public-private collaboration and the application of real-world

data is critical (Ung, 2020). A pharmacist at a community level can contribute by identifying and reporting COVID-19 patients (fig. 2).

Hospital/clinical pharmacy services

Evidence-based decisions for Medications

Most therapeutic drugs against COVID-19 are in the phase of clinical trials for efficacy and safety but currently being used to treat and manage patients. The integration of existing data, clinical understandings, distinct patient characteristics, and the provision of data-based diagnosis, as well as care to patients, is of great importance (Chen *et al.*, 2020). As a team member of health care professionals, hospital or clinical pharmacists should contribute to good use of the pharmacy knowledge and thoroughly integrate clinical advice and clinical studies to support clinicians in framing and improving therapy of COVID-19 hospitalized patients.

Drug safety and efficacy monitoring

There is currently no approved effective therapeutic drug for treating COVID-19. Based on pre-approval anti-viral medicines are in current clinical trials including anti-malaria drugs, anti-HIV drugs, and anti-influenza drugs. Clinical evidence on the effectiveness of pharmaceutical products for COVID-19 is still lacking (Wang *et al.*, 2019). Therefore, clinical pharmacists should team up with physicians to evaluate and analyze the safety and efficacy of the products, acquire indications of drug effectiveness in clinical care, if necessary, and continue to optimize drug regimens to facilitate COVID-19 treatment.

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Drug interactions management

Anti-viral drugs are associated with multiple drug reactions and have a narrow therapeutic index. All prescribed drugs for comorbid conditions as well as COVID-19 may result in drug interactions and making therapeutic management more difficult. Therefore, to prevent signs of aggravation caused by drug reactions, pharmacists ought to be very diligent about potential drug-drug interactions, enhance medication and diet monitoring for patients (Zheng *et al.*, 2020).

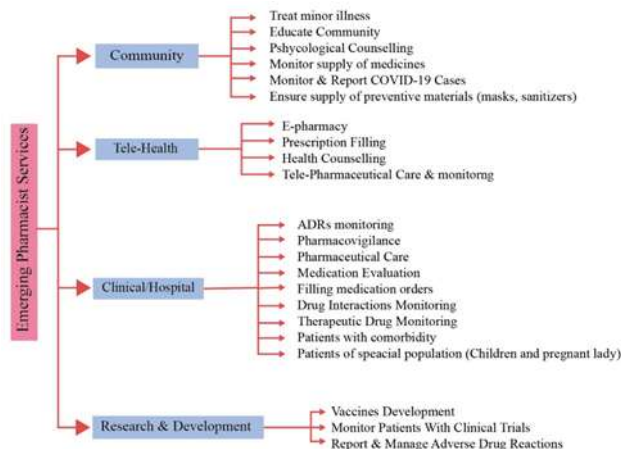


Fig. 1: Emerging Role of Pharmacist as emergency care of COVID-19; Reused with permission from Springer Nature (Hamid *et al.*, 2020).



Fig. 2: Identification and Reporting of COVID-19 patient by a community pharmacist.

Pharmaceutical Care Plans

COVID-19 patients with underlying common conditions are vulnerable to the progression of the disease. The treatment regimens for such patients are usually more complex (R. Wang *et al.*, 2020). There are several interactions between anti-viral medications and other prescribed drugs, also the effectiveness and protection of the treatment can be affected.

In such a scenario, pharmacists should improve therapeutic monitoring for those patients with underlying diseases. Monitoring of narrow therapeutic index drugs such as ritonavir and lopinavir, also anti-infective drugs such as voriconazole should be improved. Clinical indicators such as International normalized ratio (INR), blood pressure, and blood glucose should be observed thoroughly and medicines doses adjusted accordingly.

In general, COVID-19 can easily infect humans of all ages. In the case of pregnant patients, full consideration should be given to the physiological factors of pregnancy. For therapy purposes, it is suggested to use medicines of category B or C as approved by the Food and Drug Administration (FDA) and the use of category D is prohibited. (Jin *et al.*, 2020). Therapeutic and vital signs monitoring of patients as well fetuses during medication usage regularly as indorsed, and change treatment plan if required. Pharmacists should advise lactating mothers to stop breastfeeding to avoid the spread of disease (Liang and Acharya, 2020).

The implementation and execution of pharmaceutical services are quite important in the currently ongoing coronavirus pandemic. Pharmacists formulate a protocol to provide pharmaceutical care plans (fig. 3) to comorbid patients as well as a special population. Pharmacists need to check drug interactions, adverse reactions, mental well-being, look forward to minor illnesses, ensure medication safety and effectivity, and advice the general public about preventive measures.

Vaccines Research, Development and Coverage

Vaccination is one of the most powerful approaches for preventing COVID-19 from spreading worldwide. Pharmacists should provide general information on vaccine production to patients. Recombinant adenovirus vector vaccines Ad5-nCoV and nucleic acid vaccine mRNA-1273 have currently entered clinical trials of phase 1 in the United States and China. In the interim, 52 candidate vaccines are under pre-clinical research for assessment of safety and effectiveness (Organization, 2020). Further vaccines are expected to reach clinical researches or emergency use by April 2020. Hospital pharmacists should assist physicians and immunologists closely monitor their clinical effects and adverse reactions after vaccination for subjects participating in clinical trials

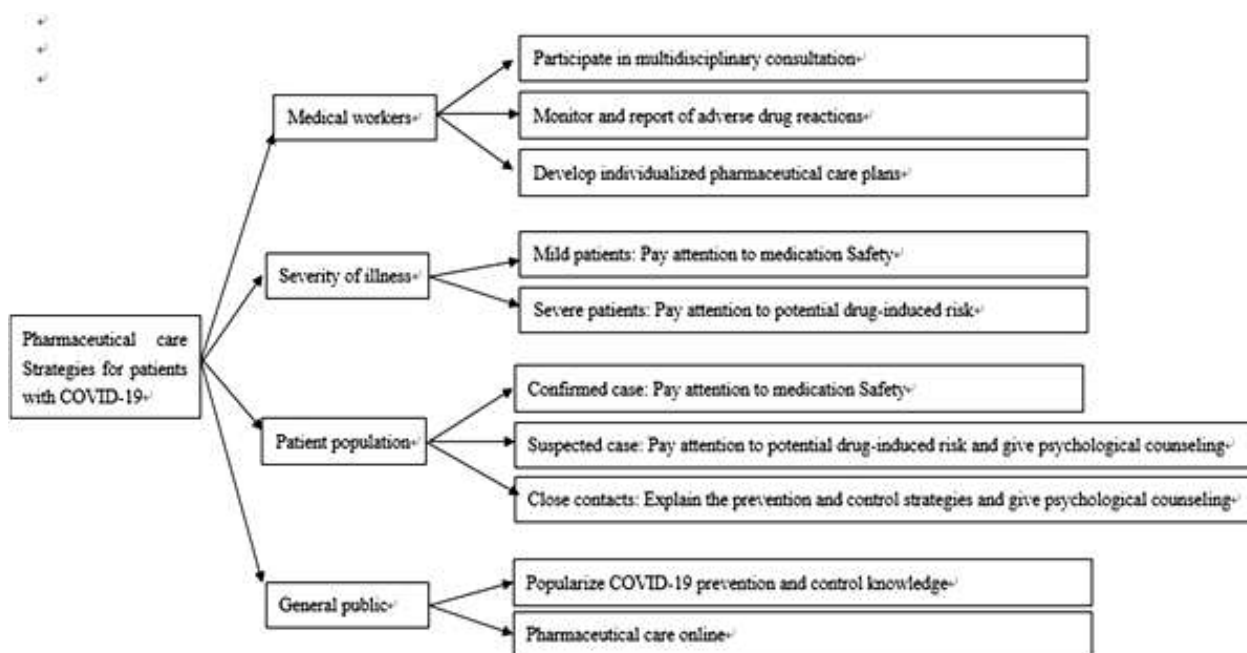


Fig. 3: Recommended Pharmaceutical care Plans in Response of COVID-19; Reused with permission from Elsevier (Ying *et al.*, 2020).

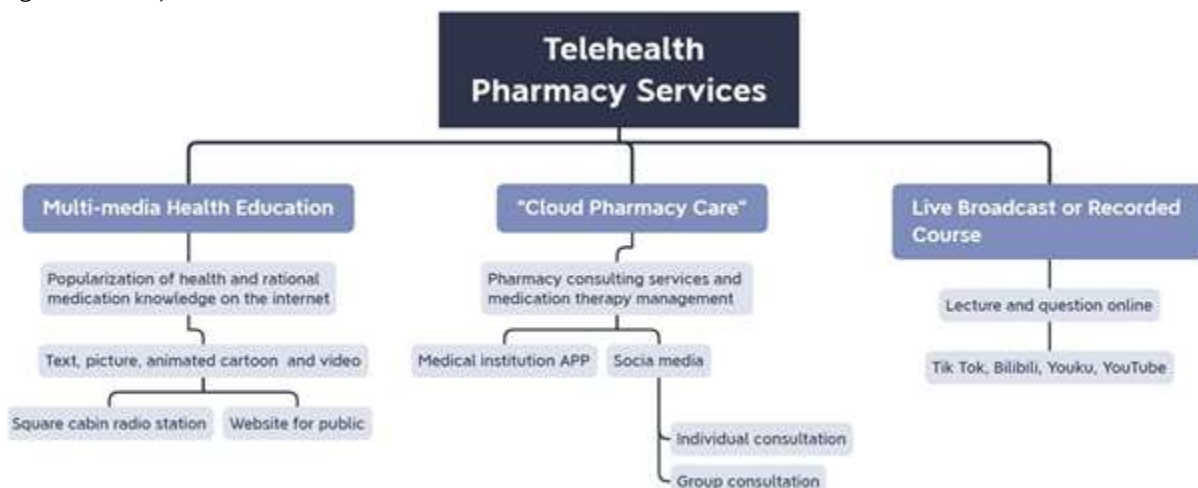


Fig. 4: Tele health Pharmacy Services Model; Reused with permission from Elsevier (Li *et al.*, 2020).

related to the vaccine. The pharmacists also contribute to vaccination coverage by working as immunizer, promoting community individuals for vaccination and also to support other healthcare professionals (Hamid *et al.*, 2019).

Tele-Pharmacy Services

Electronic Health Education

The pharmacist in Wuhan set up a Fangcang cover radio broadcast to build COVID-19 related guidance, management, and drug awareness, to alleviate patients' dread and apprehension about the illness, incorporating a progression of talks on the sound utilization of medicines (fig. 4) (Li *et al.*, 2020). As well as pharmacists can provide health care facilities in terms of preventive measures by recording video lectures and delivering to

healthcare personals and also using social media to spread the message (fig. 4).

Tele-Pharmaceutical Care

Online health services are now adopted globally due to the suspension of public transport and lockdown in various populated regions. To improve the viability of medication treatment for mild illnesses, on account of incredibly constrained clinical resources, pharmacists ought to provide pharmaceutical and psychological advice to patients (Sanders *et al.*, 2020). Based on the comorbidity attributes of the influenced individuals, clinical pharmacists should assume an indispensable job in the compromise of meds and actualize medication treatment. To encourage clinical treatment, healthcare workers in Wuhan, China approached electronic data

frameworks, upheld by cloud platforms, and connected to more significant level medical clinics (fig. 4) (S. Chen *et al.*, 2020).

To address the issues of pharmaceutical administrations for patients in Fangcang Emergency Clinics, China, pharmacists have propelled an online pharmaceutical checking information system. This online pharmaceutical service model primarily utilizing a smartphone application “WeChat” (Li *et al.*, 2020).

CONCLUSION

COVID-19 is a global health emergency and need strict implication of policies as to stop dynamic transmission of SARS-CoV-2. As every healthcare professional giving the best to fight against the disease. Currently, pharmacists have renowned roles as to identify, report, and manage patients through practicing standard procedures at community level, clinical/hospital level, research and development level as well as practicing through online services.

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REFERENCES

Chen S, Zhang Z, Yang J, Wang J, Zhai X, Bärnighausen T and Wang C (2020). Fangcang shelter hospitals: a novel concept for responding to public health emergencies. *Lancet*, **395**(10232): 1305-1314.

Chen ZM, Fu JF, Shu Q, Chen YH, Hua CZ, Li FB, Lin R, Tang LF, Wang TL and Wang W (2020). Diagnosis and treatment recommendations for pediatric respiratory infection caused by the 2019 novel coronavirus. *World J. Pediatr.*, **16**(3): 240-246.

Hamid H, Masood RA, Tariq H, Khalid W, Rashid MA & Munir MU (2020). Current pharmacy practices in low- and middle-income countries; recommendations in response to the COVID-19 pandemic. *Drugs Ther. Perspect.* doi.org/10.1007/s40267-020 00745-7

Hamid H, Tabassam N, Mehboob T, Aslam R, Bashir I and Khan KI (2019). Morbidity and mortalities by rotavirus: Review for strategic measures. *Pak. Armed Forces Med. J.*, **69**(5): 1149-1153.

Jin YH, Cai L, Cheng ZS, Cheng H, Deng T, Fan YP, Fang C, Huang D, Huang LQ and Huang Q (2020). A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). *Mil. Med. Res.*, **7**(1): 4.

Li H, Zheng S, Liu F, Liu W and Zhao R (2020). Fighting against COVID-19: Innovative strategies for clinical

pharmacists. *Res Social Adm Pharm.*, S1551-7411(20): 30328-4.

Liang H and Acharya G, (2020). Novel corona virus disease (COVID-19) in pregnancy: What clinical recommendations to follow?. *Acta Obstet Gynecol Scand.*, **99**(4): 439-442.

Organization WH. (2020). DRAFT landscape of COVID-19 candidate vaccines [Online]. Available: <https://www.who.int/blueprint/priority-diseases/key-action/novel-coronavirus-landscape-ncov.pdf> [Accessed 26th April 2020].

Sanders JM, Monogue ML, Jodlowski TZ and Cutrell JB (2020). Pharmacologic treatments for coronavirus disease 2019 (COVID-19): A review. *JAMA*. **323**(18):1824–1836. doi:10.1001/jama.2020.6019

Ung COL (2020). Community pharmacist in public health emergencies: Quick to action against the coronavirus 2019-nCoV outbreak. *Res. Social Adm. Pharm.*, **16**(4): 583-586.

Wang C, Shi QP, Ding F, Jiang XD, Tang W, Yu ML and Cheng JQ (2019). Reevaluation of the post-marketing safety of Xuebijing injection based on real-world and evidence-based evaluations. *Biomed Pharmacother*, **109**: 1523-31. doi.org/10.1016/j.biopha.2018.10.190

Wang R, Xu Q and Li L (2020). Pharmacological care strategy for antivirals in patients with COVID-19 complicated by underlying disorders. *Chin. J. Hosp. Pharm.*, **40**: 1-7.

Ying W, Qian Y and Kun Z (2020). Drugs supply and pharmaceutical care management practices at a designated hospital during the COVID-19 epidemic. *Res Social Adm Pharm.*, S1551-7411(20): 30325-9.

Zheng SQ, Yang L, Zhou PX, Li HB, Liu F and Zhao RS (2020). Recommendations and guidance for providing pharmaceutical care services during COVID-19 pandemic: A China perspective. *Res. Social Adm. Pharm.*, S1551-7411(20): 30284-9.