

Resource husbandry in challenging times

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Abstract

Coronavirus disease 2019 (COVID-19) pandemic has put a huge pressure on healthcare systems across the globe, more so in developing countries. Not only patients of acute febrile illness and respiratory problems but also patients with other acute and chronic diseases are facing challenges while seeking healthcare, getting laboratory investigations done and obtaining medications. Healthcare workers have their challenges including limited resources, lack of personal protective equipments, and fear of contracting COVID-19. Resource husbandry, which refers to the judicious use of available stocks, is a vital concept that needs to be promoted during such challenging times to combat the shortage of medical resources while simultaneously providing effective treatment to the patients. Some easily implementable concepts of resource husbandry can have a significant impact and result in minimising trouble for many patients during a challenging time.

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Coronavirus Disease 2019 (COVID-19) Pandemic: Challenging Times

Pandemics are crises that can raise unforeseen challenges worldwide. The ongoing global pandemic of COVID-19 has put the healthcare systems worldwide under immense pressure. The unprecedented scenario has also proven to be a testing time for healthcare systems across the globe, especially for developing countries like India and Pakistan. This has caused a severe shortage of medical workers, including doctors, nurses, and paramedics,

which is exacerbated by a shortage of personal protective equipments (PPEs) and fear among healthcare workers. Following are some of the challenges faced in these times:

1. Accessibility to resources

The shortage of health professionals, along with the lockdown in many states as well as restrictions on travel and minimal public transport, combined with the general public apprehension regarding contracting the disease, is causing patients with various medical illnesses from seeking proper and timely medical attention.

2. Availability of resources

Patients are equally facing challenges in gaining access to laboratory and radiological investigations. Waiting time in the hospital and laboratories to get one's turn especially in the public sector as well as maintaining social distancing in these areas is an equal challenge and fear of catching COVID-19 from these places is a real threat.

Another challenge during this time is the non-availability of medicines in many areas especially semi-urban and rural areas. This is again because of multiple reasons like partial functioning of manufacturing plants because of lockdown and decreased human resources, decreased availability of raw materials because of dependence on other countries for raw materials and current international restrictions, decreased supply of imported medicines and severe supply-chain disruptions at various levels within the country as well.¹ Another aspect to consider is the hoarding of drugs by the public especially for chronic diseases like diabetes and hypertension, which occurs due to fear of running out of stock.

3. Affordability of resources

Countries are not only facing a health crisis but are also struggling on the economic front. Lockdowns throughout nations have caused a cessation of economic activities such as trading activities, non-essential businesses, travel, construction, and other industrial activities, hence causing severe job losses.

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This has specifically impacted the daily wage workers who are now struggling to make ends meet. In such a scenario, being able to afford medical care or purchase medications becomes an uphill task for many and can potentially lead to worsening of their medical illness.

Resource Husbandry

These times of crisis call for an innovative approach towards dealing with the lack of resources. Resource husbandry, which refers to the judicious use of available stocks, is a vital concept that needs to be promoted during these hard times to combat the shortage of medical resources while simultaneously

can be text-based or can be carried out via audio or video calls. Medical care providers can triage patients based on the severity of symptoms. Those patients who exhibit mild symptoms can be advised symptomatic treatment and telemonitored regularly. In case of worsening of symptoms, the patient can be asked to report to the hospital. In addition to these patients, telemedicine is of significant importance to the patients having chronic medical conditions and who are at a higher risk of contracting the infection and developing complications, in case of exposure to the hospital environment.

2. Medication refills for patients with

Table-1: Challenges in current scenario of and possible solutions by resource husbandry.

Challenges	Possible solutions
Accessibility to a healthcare provider	<ol style="list-style-type: none"> 1. Telemedicine 2. Allowing refill of medications for chronic medical illnesses by dispensaries based upon their previous prescriptions 3. Triage of patients in the hospital 4. Use of clinical diagnostic criteria/clinical scores in place of laboratory/radiological investigations wherever possible
Shortage of oral drugs	<ol style="list-style-type: none"> 1. Changing brand name 2. Using a different drug from the same class of drug 3. Using a different class of drug 4. Breaking of scored or unscored tablets
Shortage of injectable drugs	<ol style="list-style-type: none"> 1. Substitution with oral drugs, if possible 2. Use of biosimilar agents/substitutes
Affordability	<ol style="list-style-type: none"> 1. Use of cheaper substitutes/generics 2. Avoid prescribing non-essential drugs like costly multivitamins
Shortage of Personal Protective Equipment (PPE)	<ol style="list-style-type: none"> 1. Boost local manufacturing of PPE 2. Judicious use of PPE

providing effective treatment to the patients. A summary of challenges in the current scenario and possible solutions by resource husbandry are summarised in Table-1.

A. Application of Resource Husbandry in Seeking Healthcare

1. Telemedicine

Given the trials discussed above, it is imperative to come up with alternate means to bridge the gap between doctors and patients. This can be done with the use of modern technology, a huge and up-coming part of which is telemedicine. Telemedicine allows faster and timely access to medical services that in these situations are hard to access. Telemedicine can be customised depending on several factors like patient symptoms, access to the internet, the gadgets that patients and family members are using, and education level. The doctor-patient communication

chronic diseases

Patients with chronic medical conditions who are currently stable should be allowed to refill their medications based upon their previous prescriptions. This ensures patient compliance, which decreases the likelihood of worsening of their medical condition.

3. Others

Many states and countries are now utilising services of different unrelated specialty doctors to treat COVID-19 patients. Due to the dearth of specialist doctors, volunteering should be promoted amongst final year medical students and medical graduates who have the knowledge and capacity to treat common ailments. This can also be accompanied by leveraging nurses and other paramedics to help amplify doctors' capacity during this time of crisis

B. Hospital Care

1. Triage of patients in hospital care

Suspected patients of COVID-19 should be triaged when they arrive at the healthcare facility based on the severity of their symptoms, so that they can be provided medical attention according to their needs. Intensive Care Unit beds and ventilators should be prioritised for patients who have better chances at recovery and are expected to have a good prognosis.

2. Postponement of elective surgeries

Most of the hospitals have postponed elective procedures in the current scenario, which helps save resources like medical devices, sterile equipment and also helps to conserve manpower.

3. Cutting down on routine outpatient department timings

Cutting down on routine and non-essential outpatient department timings avoids exposure of both, the patient and the hospital staff, to potentially infectious cases. Consultations can be carried out through telemedicine, as discussed above.

C. Investigations

1. Using questionnaires for screening and assessment

During these times when there is a shortage of resources, with medical care being provided on a priority basis, it is necessary to come up with alternate means of screening and diagnosing common medical illnesses. Due to a shortage of medical resources and lesser patient access to healthcare, medical care providers should try to place significant emphasis on the patient's reported clinical symptoms and signs in order to arrive at a diagnosis. Questionnaires are an important tool that can assist with the screening, diagnosis, assessment, and prognosis of patients for several medical conditions such as those high-lighted in Table-2.

Table-2: Clinical screening and assessment tools for common medical conditions.²⁻⁶

Medical condition	Screening and Assessment Methods
Diabetes mellitus	1. The Hypoglycaemia Awareness Questionnaire 2. Diabetes Self-Management Questionnaire (DSMQ)
Congestive Heart Failure	1. Left Ventricular Dysfunction Questionnaire (LVD 36) 2. Minnesota Living With Heart Failure Questionnaire (MLHFQ)
Chronic Kidney Disease	1. Screening for occult renal disease (SCORED)

2. Law of Investigative Parsimony

The need of the hour is to focus on ordering targeted investigations that have a high sensitivity and specificity. This is in alignment with the Law of Investigative Parsimony, which encourages the use of minimal investigations for screening, diagnosing, monitoring and following up of a disease without adversely impacting patient wellbeing.⁷

D. Treatment

1. Law of Therapeutic Parsimony

In addition to the Law of Investigative Parsimony, such situations also warrant the need for implementation of the Law of Therapeutic Parsimony, which states the need to use minimal therapeutic interventions to replace multiple ones, to achieve similar therapeutic outcomes.^{8,9}

2. Treatment with less expected side effects, less monitoring and easy administration

Due to the difficult administration of injectable drugs, oral medications should be preferred during these circumstances since they can be taken at home and in such situations, might have a better compliance rate. For instance, oral vitamin B12 administration can be preferred to intramuscular injections. Another aspect while treating patients in such situations is to administer drugs that have fewer expected side effects and need lesser monitoring, even if they have lesser efficacy.

3. Dealing with a shortage of pharmaceutical drugs

In case of unavailability of medication, the brand name can be changed to the one that is available or a change in the class of the drug can be considered. In case of a shortage of fixed-dose combinations, their substitution by individual drugs is an alternative. Further, if there is a shortage of one of the individual drugs from the combination, a single class of drug can be used for treatment after making suitable dose adjustments, while keeping in mind the adverse effects of the drug. Breaking of scored tablets or even sometimes unscored tablets is another means which can be used in such critical times as it provides dose flexibility and can sometimes be more cost-effective.¹⁰ Similarly, in case of non-availability, a certain type of insulin can be replaced with its closely matching formulation, for example changing Homolog Mix-25 to

Novomix-30 or vice versa.

4. Cheaper alternatives

Most of the healthcare expenditure in developing countries like India and Pakistan is self-funded by the patient. In such circumstances of the financial crisis, cheaper drugs with similar efficacy, including the use of generic drugs and biosimilar agents are recommended.¹¹

E. Non-Pharmaceutical Interventions and Lifestyle Modifications

While medications play an important role in treating medical conditions, non-pharmacological interventions and lifestyle modifications are equally important in preventing further progression of the disease. Patients need to be educated regarding the continuation of home exercises during this period, following a healthy diet, avoiding smoking and limiting alcohol, and using measures for stress management like deep breathing, meditation, and yoga.¹²

F. Maintaining a Healthy Doctor-Patient Bond

These unprecedented times have led to a disruption in the doctor-patient communication. In these stressful times, the medical care providers should be empathetic towards their patients by understanding the amount of discomfort and anxiety related to as well as the mental and financial repercussions caused by the situation.

G. Psychological Well-Being

1. For the general population

(a) Using reliable sources of information for updates

The information overload available on social media is not always reliable and can make people feel overwhelmed and anxious. People should be encouraged to refer to verified sources of information like official government websites to stay up to date and aware.

(b) Staying in touch with close ones through digital media

The break in people's daily routines, financial instability, lack of job security, and having to spend the majority of their time at home can be a challenging task. This can create feelings of loneliness and depression, especially in elderly individuals and also

amongst people who are living alone. It is important to connect with friends and family via video chat and phone calls. Even a few minutes of digital interaction each day can help people maintain emotional stability.

2. For the health care workers

(a) At the workplace

The people working at the frontlines have been dealing with immense amounts of pressure in all areas of life. A major cause for concern is their safety and health, along with those of their families. The shortage of personal protective equipment (PPE) only exacerbates the situation. Hospitals must ensure that healthcare providers get enough breaks between shifts to relax and process their emotions. Another helpful measure would be to alternate work shifts from high-stress to low-stress environments regularly. Healthcare workers with less work experience should be teamed up with their more experienced colleagues to deal with the situation in a more efficient manner.

(b) At home

These stressful times can lead to unhealthy coping mechanisms. It is advised that healthcare workers try to get enough amount of rest, consume a healthy diet, and stay connected with friends and family through digital media.

Summary - Lessons for the Future

Planning is a crucial part of dealing with a catastrophic event, such as an infectious disease pandemic. Formulation of a pandemic response policy is necessary to deal with the crisis in a way that allows the responders to have access to important information promptly. This involves building up of a decision-making model based on data gathered from situational and interventional analysis done during the ongoing period of the pandemic.¹³

Similarly, strategies should be developed to combat the shortage of PPEs like increasing domestic production of PPEs, training workers to use them conservatively, and reserving PPEs for healthcare workers who are working at the front lines and are the most vulnerable to the transmission of infection.¹⁴

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