



## Review

## Covid-19 pandemic outburst in Saudi Arabia: A glimpse

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## ABSTRACT

**Synopsis:** Severe Acute Respiratory Syndrome Coronavirus2 (SARS-CoV2) provoked alertness globally. Existing pandemic eruption of infections with SARS-CoV2 has been phrased as coronavirus disease 2019 (covid-19). Worldwide pneumonia outburst attributable to new SARS-CoV2 alleged to be originated in Wuhan city of China and has affectation of enormous danger regarding civic wellbeing. As of 11 March 2020, international death toll owing to outburst of new coronavirus was approximately 3,800, and about 110,000 have been declared as confirmed cases. The novel SARS-CoV2 demonstrated competence with respect to human to human communication; therefore depicted exponential intensification of cases. As of March 23, there are 374,513 collective cases of global infections; more than 16,350 deaths and number of recovered cases is 101,554. Now Europe has turn out into new epicenter of lethal coronavirus.

More than one third of the covid 19 cases are currently outside China. Presently Italy is one of worst hit countries followed by Spain. The rapid global widespread of novel covid-19 viruses lead to World Health Organization (WHO) to declare outbreak as pandemic. Given to seriousness of present scenario an accurate and rapid classification of noxious pathogenic virus is important which will lend a hand in opting for best fitting drugs. The screening program will aid saving people's lives and help to put off the pandemic situation. The scientists and researchers should collaborate nationally and internationally to win the battle against novel covid-19. We aimed to represent covid 19 outburst scenario in general and Saudi Arabia in particular. This short review report very briefly highlights covid-19 syndromes; propagation; Middle East outburst, natural products as cure for viral diseases, probable psychosomatic effects, protective measures and Islamic wisdom. SARS-CoV2 is subsequent coronavirus outburst that perturbs Middle East, after SARS-CoV and MERS-CoV which has been originated in kingdom of Saudi Arabia in year 2002 and 2012 respectively. The report covers information and developments till 23rd of March 2020 on basis of current published data and studies published on different scientific web-pages.

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## 1. Overview

Coronavirus 2 (SARS-CoV2) frequently abbreviated as covid-19 (Fig. 1) is succeeding coronavirus outburst that impinge on Middle East after eruption of MERS-CoV which was documented in Saudi Arabia in 2012. United Arab Emirates (UAE) being primary Middle East nation to account a patient affected by coronavirus, next to Wuhan coronavirus outburst in China. This killer pandemic is totally out of control. The world is dying due to robust covid-19. Nonetheless; there are some Middle East countries which are not/or least affected by pandemic eruption of coronavirus such as Syria, Turkey, and Yemen (As of March 17). However; on the other hand Iran has utmost numeral of coronavirus patients, tracked by other nations such as Bahrain and Kuwait respectively. To best of author's acquaintance there is no study till now which provides Middle East (in particular Saudi Arabia) scenario due to robust covid-19 infection. In this review paper; we briefly provide glimpse about severity of covid-19 transmission as well as current protective measures the Government of KSA has taken to prevent fatal situation as experienced by China; Italy, South Korea; Spain and rest of the world.

Nevertheless, in recent years tremendous scientific advancement has been made in medical systems in order to wrestle with communicable ailments; however infections caused by viruses still remains a tough task to deal with successfully. The infectious syndromes create noteworthy human health hazards and has given rise to roughly one fourth of casualties internationally (Bogoch et al., 2020; Lu et al.). Overwhelming covid-19 patients are fighting a war and finally losing. The coronaviruses represent Coronaviridae family which lead to neurological respiratory arrest and sickness (Zhao et al., 2020). To date, six human being coronaviruses (HCoVs) were recognized viz., HCoV-229E, HCoV-HKU1, HCoV-OC43, HCoVNL63, SARS-CoV, and MERS-CoV (Du Toit, 2020). It is noteworthy to mention here that among above mentioned viruses; the SARS-CoV and MERS-CoV are prominent with respect to pandemic (Ren et al., 2020). Appearance of new SARS-CoV2 in Wuhan

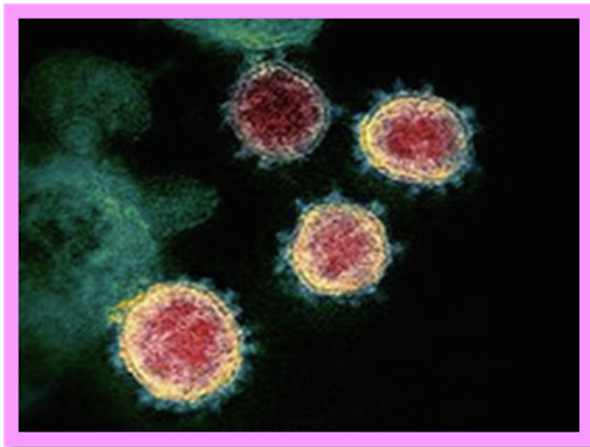


Fig. 1. Coronavirus2 (SARS-CoV2) image adapted from Wikipedia.

and its consequent extend at national and international level like wildfire is being awfully demanding to global health care society to tackle this potential infectious sickness i.e. covid-19. Conclusively; uniqueness of virus, quick intercontinental spread as well as deficient remedial measures have impelled WHO International Health Regulation (IHR) emergency committee to affirm infection as Public Health Emergency of International Concern (PHEIC) on January 30, 2020 (Barry et al., 2020). As of 22 February 2020, there were 77,816 established patients of covid-19 and 2012 deaths (<https://www.worldometers.info/coronavirus/>). At present (March 23, 2020), there are 374,513 recorded covid-19 cases, over 16,350 deaths authentication from all over earth. Astonishingly, Europe has been turned out as recent focal point of covid-19. In less than a month; covid-19 deaths exceeded 6,000. More to the point, in one single day 793 deaths have been recorded. Interestingly till date no death information has been reported by Kingdom of Saudi Arabia. Given to seriousness of infections as a result of novel covid-19; it is imperative to set up quick standard diagnostic test for uncovering infectious covid-19 in order to avoid successive secondary outbreak. Additionally there is an immediate need of vaccine which should be safe and effective with least/or no side effects.

### 1.1. Covid-19 syndromes/or manifestations

Extensive and continuous studies going on covid-19 infections have specified initial and later disease syndromes (Fig. 2). In broader sense the warning signs of covid-19 infection normally emerge out following an incubation time of roughly two to fourteen days (Li et al., 2020). However; commencement of covid-19 warning signs to death varied as of 6 to 41 days, mean of 14 days (Wang et al., 2020b). However; this syndrome may vary with age and condition of patient's immune system. Wang et al. have suggested shorter duration in cases with age above seventy and may take longer time in patients below seventy years (Wang et al., 2020b). Fever, cough, and fatigue, sputum production, headache, haemoptysis, diarrhoea, dyspnoea, and lymphopenia have been

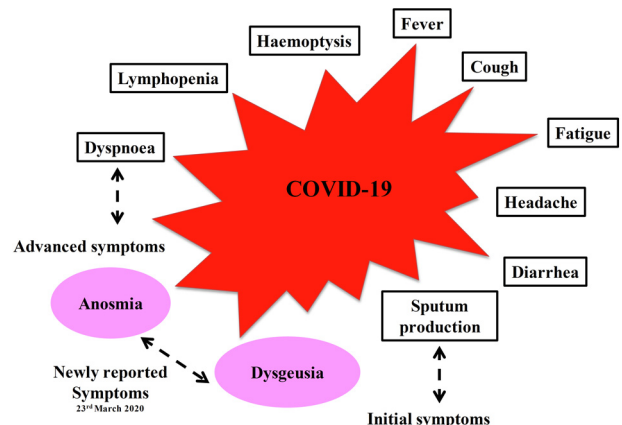


Fig. 2. General symptoms at onset of Covid-19 illness.

listed as frequent signs after inception of covid-19 disease (Carlos et al., 2020; Huang et al., 2020; Ren et al., 2020; Wang et al., 2020b). A very recent (23rd March) investigation by The American Academy of Otolaryngology has reported that loss of smell (Anosmia) and altered taste (Dysgeusia) could be significant warning signs of covid-19 (Fig. 2) irrespective of signs of respiratory disease. (<https://www.today.com/health/coronavirus-covid-19-symptoms-may-include-loss-smell-or-taste-t176597>)

**2. Covid-19 host and propagation**

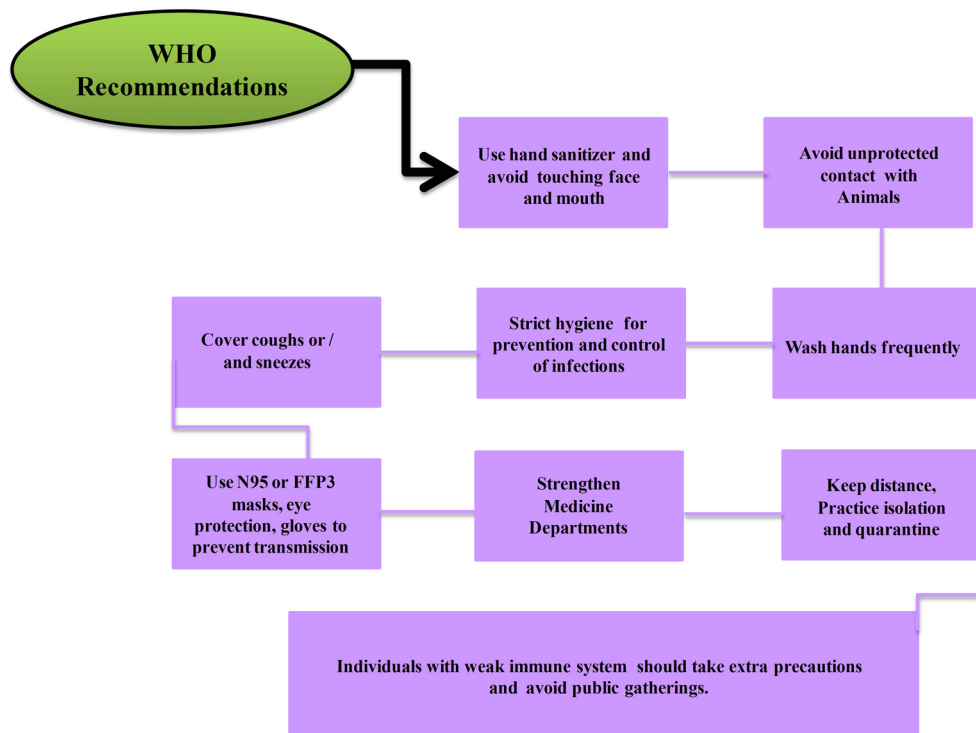
Rigorous hard work is being made by distinguished researchers and scientists throughout globe to identify authentic host and intermediate carrier of this scary, life taking covid-19 infections to human beings. Investigations suggested that most of infected persons were found having contact with wet animals in Wuhan (Rothan and Byrareddy, 2020). Considering present scenario, it has been recommended probably to be of zoonotic origin. Primary information recognized two species of snakes may be potential host of covid-19. Till now no substantial confirmation of covid-19 host other than mammals and birds (Bassetti et al., 2020; Ji et al., 2020) is achievable. The new covid-19 depicted approximately 88% similarity with two bat originated severe acute respiratory syndrome (SARS) akin to coronaviruses (Lu et al., 2020). Recently a lot of studies recommended that human to human communication/or droplets of diseased person is a possible mode for transmission of covid-19 infection (Carlos et al., 2020). During an alternative scientific research it has been stated that covid-19 infection is not transmittable from infected pregnant mothers to unborn/or newborn babies; however covid-19 infection can pass at time of birth (Chen et al., 2020a). To restrict propagation of lethal covid-19 WHO and other scientific societies have issued specific guidelines which are shown in the below given figure (Fig. 3).

**2.1. Covid-19 Middle East outburst scenario**

Covid-19 is subsequent coronavirus outburst after SARS-CoV and MERS-CoV; documented in Saudi Arabia in 2002 and 2012 correspondingly. UAE was first Middle East country to inform a coronavirus positive case, subsequent Wuhan coronavirus eruption in China. Up to date covid-19, has reached to 195 countries and territories including China (<https://www.worldometers.info/coronavirus/>); prompting WHO to declare disease as a global pandemic. As of March 23, there are 374,513 cumulative cases globally, more than 16,350 deaths. Now Europe has turn into new epicenter of coronavirus. More than one-third of the Covid-19 cases are currently outside China. The numbers of recovered cases till now (March 23, 2020) are 101,554 (<https://www.worldometers.info/coronavirus/>). A huge number of cases (23,049) have been reported from Iran alone and 1,812 deaths; one of worst hit countries in Middle Eastern region. Other Middle East countries which have been reported to have covid-19 infection are as follows: Qatar, Egypt, Bahrain, Kuwait, Iraq, Lebanon, Saudi Arabia, UAE, Algeria, Palestine, Morocco, Oman, Tunisia, Jordan, Sudan, Somalia and Mauritania. The number of covid 19 cases reported and deaths have been shown in Table 1. Minimal cases have been reported from Somalia followed by Mauritania and Sudan (Table 1).

(<https://www.natureasia.com/en/nmiddleeast/article/10.1038/nmiddleeast.2020.36>).

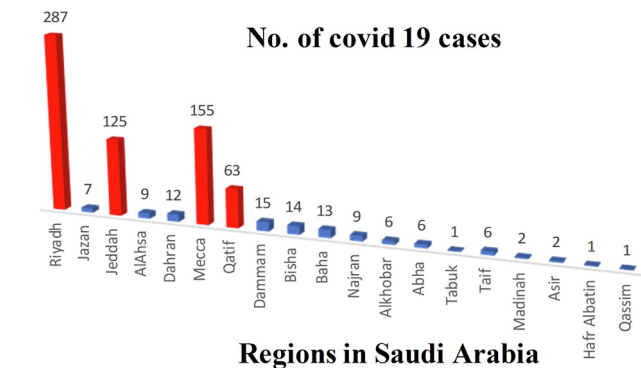
As of March 23, 2020, The Saudi Arabian Health Ministry broadcasted that total number of covid-19 cases had augmented to 767, with 51 recent confirmed cases. The distributions of infections are shown in figure (Fig. 4). Out of the 767 cases, 28 have recovered, remaining are getting intensive medical care in quarantine, while 2 cases are serious. Till date (June 19, 2020) there is huge rise in covid 19 cases. Out of total 150,292 cases, recoveries are 95,764. However, total deaths are 1,184. The reported mortality on partic-



**Fig. 3.** Schematic representation of general instructions to deal with Covid-19 infection.

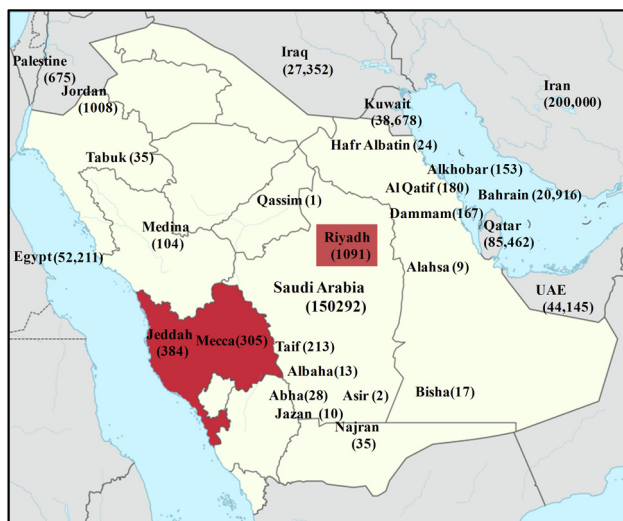
**Table 1**  
Middle East countries scenario of Covid-19 infection as of March 2020.

Country	Cases	Deaths
Saudi Arabia	562	–
Egypt	366	19
Bahrain	377	2
Kuwait	189	–
Iraq	266	23
Lebanon	267	4
Qatar	501	–
UAE	198	2
Algeria	230	17
Palestine	59	–
Morocco	143	4
Oman	66	–
Tunisia	89	3
Jordan	127	–
Sudan	2	1
Somalia	1	–
Mauritania	2	–



**Fig. 4.** Bar graph showing Covid-19 reports in KSA, March 23, 2020.

ular day (As of June 19) is 45 with 4,301 new cases and 1,849 recoveries. The cases are geographically divided and distribution is highlighted in map (Fig. 5). (<https://english.alarabiya.net/en/News/gulf/2020/03/20/Saudi-Arabia-confirms-70-new-coronavirus-cases-total-at-344.html>)



**Fig. 5.** Map showing locations and no. of Covid-19 infected cases, June 19, 2020.

## 2.2. Life with uninvited covid-19 in Saudi Arabia

Primary outburst case of covid-19 has been announced in Saudi Arabia on 2 March, a Saudi native way back to country from Iran via Bahrain. After that, number of cases increased rapidly. It is famous proverb that extraordinary times require extraordinary measures. Therefore as a preventive step; for time being, Saudi government has restricted tourists and visitors from covid-19 affected countries. The Great Mosque (Masjid al-Haram) of Mecca and the Prophet's (peace be upon him) Mosque in Medina (Masjid al-Nabawi), has been closed for safety and sterilization purposes. Mecca is one of the busiest cities in world as this city never sleeps. But due to covid-19 pandemic all congregational prayers have been suspended (Fig. 6). The first public decision was issued (04th of March 2020) to prevent Umrah pilgrims and tourists from entering to limit the spread of covid-19 in Kingdom. Accordingly there are some precautionary measures including that Saudi Ministry of Sports halted fans from attending all sports competition. Moreover; Saudi authorities imposed a temporary ban on citizens and residents from nine countries (UAE, Kuwait, Bahrain, Lebanon, Syria, South Korea, Egypt, Italy, and Iraq). Saudi airline clogged all international flights temporarily and also closed malls and recreational places excluding medicine cabinet and supermarkets. As of 17 March 2020, The Saudi Ministry of Islamic Affairs, Dawah and Guidance announced that daily five congregational prayers and weekly Friday prayer have been suspended across the Kingdom's mosques. As of 20 March, General Presidency of Grand mosque and prophet's (peace be upon him) mosque halted presence of people and prayers even in outer courtyards. As of 23rd of March public quarantine has been applied from 7 pm to 6 am for 21 days.

## 2.3. Islamic guiding principles

Isolation and quarantine practices have been recommended in Islamic scriptures for the comfort of sick individuals and protection of healthy community ages back. It has been narrated by prophet Mohammed (peace be upon him) to his companions that in case of plague or any other communicable disease; if you listen to rigorous eruption of contagion in specific territory, never visit there; but if it outbreaks into your place also, do not leave that place (Sayili, 1980). The establishment of present quarantine system has now become basis of modern preventative medicine after discovery of communicable diseases. However; in Islamic history, the first hospital was built in 706 under kind instructions of Umayyad caliph AL-Walid in Damascus to isolate leprosy patients from other patients in hospital (Sayili, 1980). In addition to that; it is also mentioned in holy Quran that one shouldn't cause harm to oneself and others as well (Source: Al-baqarah, chapter 2: verse 195). Furthermore; Islamic protocol encouraged suspension of congregational prayers during adverse circumstances; which has been implemented during the covid-19 pandemic in almost all the Middle East countries. Conclusively the Islamic wisdom leads a way to deal with frightening and panic situations such as pandemic covid-19.

## 2.4. Natural products/or medicinal plants to cure viral infections

Worldwide catastrophe due to viral diseases is massive. Recently, it has been reported that internationally half a million casualties are exclusively due to influenza (Weir and Zaidi, 2019). Previous investigations have reported plentiful plants and herbs which have produced incredible antiviral components (flavonoids, terpenoids, lignans, sulphides, polyphenolics, coumarins, saponins, furyl compounds, alkaloids, polyines, thiophenes as well as proteins and peptides). In addition to earlier mentioned photo-



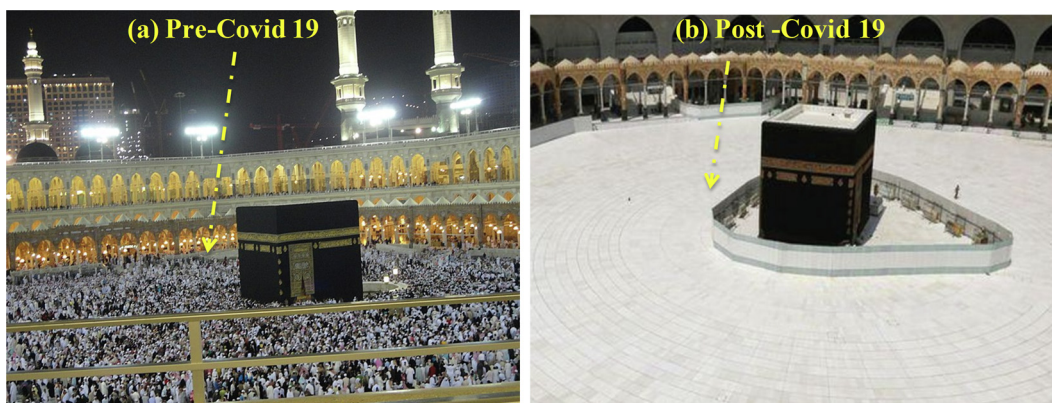


Fig. 6. (a) Al-Haram Mosque and sacred Kaaba before (a) and after (b) Covid-19 pandemic, March 23, 2020 (source: Wikipedia).

chemicals; culinary herbs, spices and herbal teas too harbor superb antiviral potential (Jassim and Naji, 2003). Convincingly; bioactive components of therapeutic plants are previously being utilized to lucratively cure various viral syndromes such as *Boerhavia diffusa*, *Eclipta alba*, *Phyllanthus amarus* (Anbazhagan et al., 2019) etc.

Similarly; plant flavonoids impart bountiful healthcare uses such as boost immune system, endow with antioxidant, anti-inflammatory, cholesterol lowering, anticancer potential. Therefore these are considered as novel compounds for advancement of drugs for viral diseases (Burkard et al., 2017). The KSA possess floral diversity and these plant species are dispersed all through Kingdom which are being applied by native people for cure of various of diseases (Al-Asmari et al., 2015; Ibrahim et al., 2017). The native plants are hardly ever been intensively explored for viral diseases; so can be screened for the same. Analogously, a lot of traditional Chinese medicinal plants are being applied for cure of endemic diseases (Maryam et al., 2020). Identically, numerous polysaccharides from medicinal plants/or mushrooms were authoritatively got certified as medicines. These can hamper viral contamination by probing some phases in virus life cycle or boosting host immune system. China Food and Drug Administration has permitted a few polysaccharide based drugs (He et al., 2019). Coupled with; there is also prevalent exploitation of medicinal plants to manage HIV infection (Anywar et al., 2020). Nevertheless; SARS patients (in year 2003) dealt with medicinal plants were greatly benefitted (Ling, 2020). Furthermore; very recently Qamar et al. accounted that phytochemicals demonstrated superior binding energies; 83 docking scores as well as intimate communications with conserved 184 catalytic dyad residues (Cys-145 and His-41) as compared to Nelfinavir, Prulifloxacin and Colistin. Hence natural products acknowledged in their investigation possibly will facilitate to establish lead drug molecules for Covid-19 (ul Qamar et al., 2020). Irrefutably; development of potential anti-covid-19 medicine/or vaccine will take months to year time. Consequently; conventional medicine based on local medicinal plants will serve as a substitute.

### 2.5. Whether hydroxychloroquine is a drug of choice?

Nonetheless hitherto there isn't any authorized medication for covid-19. Commonly applied medicines for virus are protease inhibitors, lopinavir and ritonavir or virus replication inhibitor, redem-sivir etc. Medical research with aforementioned drugs is in progress. Taking into consideration cycle of SARS-CoV2 WHO has recommended focal points for medication formulation; such as targeting virus with monoclonal antibodies, suppression of viral endocytosis via antimalaria drugs, e.g., chloroquine or hydroxychloroquine. A couple of very recent investigations have also indi-

cated that chloroquine exhibits inhibitory effect towards SARS-CoV2 under *in vitro* conditions. Its antiviral action pre- and post-infection against SARS and other coronavirus has been demonstrated in *in vitro* studies (Herraiz, 2020). Alternatively a few professionals have suggested antimalarial drug to covid-19 patients (Chen et al., 2020b; Kumar et al., 2020). Chloroquine and hydroxychloroquine possess wide range antiviral potential towards HIV, hepatitis B, Herpes simplex virus type 1, Ebola and also SARS and MERS respectively by hampering stages of replication of different viruses. Moreover; theoretically chloroquine/hydroxychloroquine may possibly interlock hemoglobin distressing cysteine proteases essential for viral propagation (Herraiz, 2020). The high hopes regarding treatment of covid-19 patients with hydroxychloroquine was due to outcome of limited clinical trials in France. The treated patients depicted noteworthy reduction in viral count. On the other hand some patients did not react to hydroxychloroquine and accounted rationale was considered as metabolism. Therefore advance clinical investigations and trials are necessary as well as are in progress.

### 2.6. Psychosomatic after effects

Due to covid-19 pandemic, earth planet has been shut down; taking a siesta. It is given to understand that infected as well as healthy folks may suffer depression due to quarantine, travel ban, fear of infection, and recurrence of disease as well as side effects of treatment itself. To overcome abovementioned worries, National Health Commission of China released a national guideline for psychological problems intervention on 27 January 2020 (Duan and Zhu, 2020). Nevertheless, psychological counseling of persons (who are suffering and had gone through covid-19 infections) will extremely be helpful to come back to normal life again.

### 2.7. Conclusive statements

Conclusively, scientists, researchers, health care practitioners as well as pharmaceutical agencies around the world are trying hard to discover cure for fatal covid-19 virus. Enormous measures such as complete shutdown, quarantine and lockdowns have already been taken worldwide to prevent fatal covid-19 virus spread. However; immediate development of new vaccine is the need of hour. It has been anticipated that existing antiviral drugs akin to Nucleoside analogues, also HIV-protease inhibitors may reduce covid-19 infection (Lu, 2020). Additionally existing antivirals like ribavirin, 5-Fluorouracil, 5-Azacytidine, Remdesivir etc were also thought to be effective (Rothan and Byrareddy, 2020) as these nucleoside analogues operate by enhancing mutations in RNA viruses and ultimately extinction (lethal mutagenesis). However;

till date no success has been obtained against robust covid-19 outbreaks. Besides; taking aforementioned measures The Saudi Health Ministry reaffirmed to control further spread of covid-19 viruses. Proper screening on airports is being done to screen passengers for covid-19 in order to avoid any untoward incident. In all cities quarantine rooms have been created in hospitals to properly treat patients. Nevertheless; funds have also been dedicated to research with Global bodies for thorough understanding of covid-19 mechanisms of infection, establishment of diagnostics systems and fast track development of vaccines.

In summary; till date (As of 31 march) WHO has not proposed any therapy for covid-19. The entire world is eagerly looking forward for a vaccine which can fight with covid-19 and can save millions of lives. There are twenty vaccines which are being in developmental stage. We expect broad-spectrum anti-covid-19 vaccine which possesses potential to combat the deadly covid-19 virus effectively and with maximum safety.

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