Short Review

Primary Health Care and COVID-19 Pandemic

Running Title: Primary Health Care and Covid-19

Deepthi R[1], Roopa R Mendagudali[2], Rashmi Kundapur[3], Bhavesh Modi[4]

[1]Department of Community Medicine, ESIC-MC PGIMSR, Rajajinagar, Bangalore, [2]Department of Community Medicine, MRMC, Kalaburagi, [3]Department of Community Medicine, K.S.Hegde Medical Academy Nitte, Mangalore, [4] GMERS Medical College Gandhinagar, Gujarat

Corresponding Author: Dr. Roopa R Mendagudali, Assistant Professor

Email: **drrooparm@gmail.com**

Abstract

Background: Over the past few weeks, the COVID-19 pandemic is impacting the global population in drastic ways. It was a health emergency in health care services hindering a lot of other services specially primary health care. The care at center to the proper referral has been an issue during lock down of COVID-19 time. *Objectives*: This short review was done to identify the problems in world faced by primary care physicians in COVID 19 pandemics and to identify the referral system maintained in COVID-19 as learning from the world. *Methodology:* The concept was planned to review all the articles on the health care delivery in the last 3 months. We tried to identify the problems in the world about how the system could not cope up with the regular health system and COVID-19 together including India. The concepts considered were challenges of health care at primary care, world's response and Indian response in managing the deficit of primary care. *Findings:* The study revealed declines in rates of primary care visit and in resources to deliver the services, 76% of physicians said the pandemic placed close-to-severe strain on their practice and millions of the children have missed their immunizations. *Conclusions:* The study suggested there is lack of continuity in essential care and the regular health care destruction has been a process in last 3 months. However, the referral and SOP of COVID-19 was not aptly made. *Recommendation:* There is a need of corrective measures in immediate effect. Indian health care delivery system needs to be focused more and given priority to combat the disease and also be prepared to face other pandemic in future.

Keywords: Covid-19, Pandemic, Primary Health Care

Introduction

In the recent past, it has been observed that there is an increase in burden of emerging diseases globally and frequent occurring of outbreaks. However, every outbreak did not reach a pandemic level as Covid-19 disease [1]. Pandemics are large-scale outbreaks of infectious disease with high burden of morbidity and mortality over a wide geographic area and cause significant economic, social and political disruption.

Globalization with increased global integration, travel, urbanization, and greater exploitation of natural environment; has led to a quick spread of these pandemics. Pandemics have had significant social and economic cost to humanity over centuries in history. One such pandemic the world is witnessing now is—the COVID-19 (Corona Virus Disease -19) caused by SARS Corona Virus-2 (SARS CoV-2), is the deadliest of all pandemics we have seen in our lifetimes [2].

Over the past few weeks, the COVID-19 pandemic has impacted the global population drastically. It is critical for people to access health-care services during the pandemic for both emergency and primary health care. The World Health Organization (WHO) defines primary health care as, "a whole-of-society approach to health and well-being centered on the needs and preferences of individuals, families, and communities." Thus, primary health care focuses on comprehensive care i.e., promotion of health and prevention of disease; treatment; rehabilitation and palliative care; and providing these services as close as feasible to people's everyday environment [3].

Access to healthcare is a fundamental human right; however, COVID-19 has left its impact on provision of primary healthcare services everywhere and in turn affected many people seeking these services [4]. COVID-19 emerged as a health emergency that has additionally hindered provision of primary to tertiary health care services. The problem arises from lack of continuum of care starting from prenatal care to immunization of newborns and progressing towards the lack of care for chronic non-communicable diseases as well. Routine health care services at the facility level and proper referral have been the major issues faced by health care system during COVID-19 lock down times. With this background, the objective of this review is to identify the problems faced by primary care physicians during COVID-19 pandemic globally, as well as in India and to identify the referral system maintained in COVID-19 as learning from over the world.

Methodology

We searched the following databases for articles published in English from January 2020 to May 2020: Pub Med, Science Citation Index and the Cochrane Library. We searched for articles using the following key words: ' problems' ,' challenges', 'barriers', 'primary health care', 'referral', 'lockdown'; #2: 'COVID 19' 'Health system'. We tried to review all the articles which spoke on the health care delivery in the last 3 months for a narrative review only. Google was used as a search engine to cover left out information. Also, through Google many news reports with scientific information were included in the review. Indian health system had more problems to deal with, as apart from the new problems, there were issues with maintenance of the existing system. The learnings from different countries could be put together to make a better healthcare system for the future. The review was categorized as challenges of health care at primary care, world's response and Indian response in managing the deficit of primary care and appropriate referral. Important scientific points in each sub-headings from scientific and news articles were taken out and the authenticity of scientific relevance was checked by the team. The narrative

review was organized to bring in detailed views and published evidence.

Results and Discussion

Challenges in health care at primary care level

COVID-19 pandemic has not only affected the health of the population in many ways but also impacted the primary healthcare access in countries around the world. Primary health care can play a significant role in the COVID-19 pandemic, by differentiating patients with respiratory symptoms from those with COVID-19, in making an early diagnosis, helping vulnerable populations deal with their anxiety, and in reducing the demand for hospital services [5, 6].

Many challenges were faced globally especially with respect to primary health care during the pandemic, given the recommendation of Center of Disease Control, "healthcare systems prioritize urgent visits and delay elective care to mitigate the spread of COVID-19 in healthcare settings." Since the WHO declared the pandemic of COVID-19, there has been a widespread concern that, it would be unsafe to attend regular appointments at clinics or hospitals for the time being. Worldwide, doctors' offices have closed their doors, and many have switched to telemedicine, following their country's guidelines. In the U.S. too, the CDC recommended that, "healthcare systems prioritize urgent visits and delay elective care to mitigate the spread of COVID-19 in healthcare settings" [7]. Similar recommendations have also been observed in India [3]. This has led to impact on prenatal care services like decreased prenatal visits, increased apprehension towards birth preparedness among expectant couple; perinatal care services and postnatal care services such as missed vaccines due to issues with routine immunization sessions. Such challenges existed more commonly in countries like India.

India is a developing nation with a large population (1.34 billion), the existing health care infrastructure and health care delivery system have already been facing challenges with respect to accessibility and affordability. The pandemic of COVID-19 has further devastated the already overburdened personnel working in the health care sector. This has created a special challenge due to the paucity of testing services, weak surveillance system and above all poor medical care.

India is facing an acute health crisis due to the huge disruption in basic health services since March 2020, as the focus shifted to containment of COVID-19. This crisis majorly curtailed immunization schedules; restricted inpatient, outpatient, and emergency treatment for communicable and non-communicable diseases; reduced laboratory investigations; and decreased access to mental health care services. Thousands of adults might have missed potentially life-saving medical treatment during the lockdown period [3]. Similarly healthcare workers, especially primary health care physicians are also facing challenges; some of these challenges have been enlisted below [8, 9].

- Decline in rate of primary care visits
- Fewer resources to deliver the services
- Lack of advancement opportunities, decline in research activities
- Understaffing of primary health care system, and increase in work load due to unexpected pandemic
- Apart from patient care, primary health care physicians are overburdened with contact tracing, regular fever surveillance and containment activities
- Lack of training / inadequate training of health staff leading to

frustration and confusion among health staff
- Inadequate supply of personal protective equipment, furthermore physicians are supposed to handle the affected patients in such circumstances only
- Poor supply of hand sanitizers, and inadequate washing facilities
- Lack of separate quarantine facilities for treating doctors who come in contact with COVID-19 affected patients
- Poor or low pay scales, no incentives.
- Poor organizational culture. Factors that contribute to culture are — opportunity for innovation, autonomy in an employee's position and flexible work schedules.
- Poor personal fit with the higher authorities
- Limited access to technology
- Not enough time with patients for general health care
- Adoption of telemedicine without any prior set protocol
- Not receiving or unsure of receiving any payment for the virtual care services provided by primary care clinicians
- Strain on routine practice of primary care clinicians due to pandemic (perceived by 76% primary care clinicians)
- Violence on COVID warriors and lack of legal actions against such instances
- Poor security for the physicians and his/her family members

The lockdown strategy to control the pandemic itself has impacted the multi-dimensional social sphere. The loss of employment of millions of people in the rural areas who are migrant workers in many cities has an important bearing from public health point of view. The emotional impact of these strategies may add to mental health issues. These migrants walked back to their villages in groups covering 500–1000 km after losing their jobs in the cities, this is distressing, and may worsen the problem as the chance of community transmission widens further. Apart from the economic suffering of the already starving society, this could disseminate or spread the disease in rural areas which may proceed to uncontrollable levels [10].

The European Respiratory Journal [11] discusses similar situations, where "the doctor is subject to a number of competing duties:

- A duty to patients
- A duty to protect oneself from undue risk of harm
- A duty to one's family
- A duty to colleagues whose workload and risk of harm will increase in one's absence and
- A duty to society."

As per the U.S. Centers for Disease Control and Prevention (CDC) obstetricians have reported that they had less frequent in-person appointments and they shifted to telemedicine completely during the pandemics, which is more convenient and safer, allowing pregnant women to receive the needed support without placing themselves at risk by attending clinics. It also reported that some doctors may find the necessity of separation of mother and child immediately after birth if the mother is suspected of SARS-CoV-2 which is known to be detrimental to the health of the newborn [12].

European countries also reported rendering their services through telemedicine. The hospitals make independent decisions about who will accompany, stay and support the woman during labor, and who is allowed to visit after birth; leading to additional worries, and uncertainties among expectant parents creating anxiety.

As on 25 April 2020, millions of children were in danger of missing life-saving vaccines against measles, diphtheria and polio due to disruption in immunization services [13]. Most countries had suspended mass polio campaigns and 25 countries had postponed mass measles campaigns, as per recommended guidelines. Given the current disruptions, this could create pathways to disastrous outbreaks in 2020 and well beyond. Similarly, in low- to middle-income countries, the gaps in measles coverage before COVID-19 were already alarming, as COVID-19 continues to spread globally, the life-saving work of providing children with vaccines has become critical [14].

In India, previous experience with other epidemics, shows that reduced access to care, medicines and diagnostics for people with life-threatening conditions, such as tuberculosis (TB) (1,200 deaths per day), can lead to an increase in mortality rate. Similarly, Guinea, the epi-centre of the 2014-2015 Ebola epidemic, reported that reduced health services led to a 53% decrease in the diagnosis of TB, and a doubling of the mortality rate due to direct and indirect impact on TB health services during epidemic [15].

Besides impacting health indicators in the country, this pandemic had also disrupted the routine reporting of the data from the health facilities. According to data released by the National Health Mission (NHM), Government of India, 21% of facilities in 10% districts, have not reported the routine data to center from March 2020 due to lockdown. Also, the data reported clearly shows that there was sharp fall in medical services such as interventions for pregnant women, however, as accredited social health activists, and auxiliary nurse and midwives were largely able to continue their work, distribution of iron and calcium supplements as well as tetanus injections were not much hampered [8].

In India, at least 100,000 children did not receive their BCG vaccination, which can provide some protection against tuberculosis (TB), and another 200,000 missed each dose of the pentavalent vaccine and the rotavirus vaccine [8].

The National Institution for Transforming India (NITI) Aayog has also observed reduced hospital admissions for severe acute respiratory illness and influenza-like illnesses under the Ayushman Bharat insurance scheme. Even treatment for non-communicable diseases and emergencies has fallen, which is of great concern. NHM data indicates that reduced hospitalization numbers could mask a lack of access to healthcare, rather than a lack of illness [8].

Overall, NHM numbers do not show a spike in deaths or diseases. However, the fall in access to institutional health, including institutional deliveries, also indicates that official data on morbidity and mortality from hospitals will not give the full picture. More people could be falling ill and even dying at home in this period.

World response to primary care possibilities

Globally, governments of different countries are reacting differently to this pandemic.
According to a recent WHO report, “the rate of progress in healthcare worldwide is too slow to meet the Sustainable Development Goals (SDGs) and will be further thrown off track by COVID-19”. The SDGs are an extensive agenda that the United Nations have adopted with the aim of curbing poverty and other deprivations, including in the realm of healthcare, globally by 2030 [16].

WHO and UNICEF have also announced an agreement to work together on COVID-19 response, through the historic, extraordinary global COVID-19 Solidarity Response Fund powered by the United Nations Foundation and Swiss

Philanthropy Foundation. The COVID-19 Solidarity Response Fund has been set up to facilitate an unprecedented global response by supporting the WHO Strategic Preparedness and Response Plan. As part of this agreement, an initial portion of the money from the Fund will flow to UNICEF for its work on vulnerable children and communities all over the world. The fund will be used to train and equip health-care workers and communities to prevent, detect and treat COVID-19. It will help countries expand their health-care capacity and mitigate social impact of this disease, especially on women, children and vulnerable social groups. This will also help to accelerate research and development of treatments and preventive vaccines against this disease [17].

Indian response to primary care deficit

India was praised by the WHO for its "tough and timely action", as the country was quick to close its international borders and enforced an immediate lockdown. This lockdown was then extended further depending on the burden of pandemic situation. The time period during lockdown has given an opportunity to Indian government to prepare for a possible rush in cases when the pandemic is forecasted to peak in the coming time based on experience from China and Italy. These countries reported that about 5-10 per cent of all infected patients require admission and will become severely ill, of which, about 70 per cent of them would require supportive care and oxygen and 30 per cent might require more advanced critical care such as ventilator support [18]. Preparedness and response to COVID-19 have differed at the state level due to diversity and uniqueness of Indian states with differing health inequalities; wide economic and social disparities; and distinct cultural values [19].

The detection, isolation and management of infected people in India had so far remained largely dependent on tertiary care hospitals but such pandemics require a change of perspective toward a concept of community-focused care. Initially, persons infected had to visit laboratory for testing situated in tertiary-care or district hospitals where the spread of infection was high and the patients had to travel long distances. Now, on the recommendation of the Indian Council of Medical Research (ICMR), field testing for COVID-19 infected containment zones has been started. For isolation of the patients, many states rely on specially designated areas or wards within tertiary hospitals, or create new large hospitals or isolation centres. The State governments and the Central government of India have started creating additional capacity in hospitals or setting up new hospitals, ensuring availability of equipment and skilled personnel [18].

Health education activities have been conducted through various media regarding social distancing and hand hygiene practices. As the epidemic is evolving, merely imposing restrictions does not promote safe behavior but fear and stigma towards disease had affected individual and collective behaviors to adapt to hygienic practices [20].

Problems in appropriate referral of COVID-19

In health care delivery systems, referral is a set of activities undertaken by a health care provider or facility in response to its inability to provide the quality or type of intervention suitable to the need of the patient. Implementation of referral guidelines includes important factors such as: skilled staff availability capable of making appropriate referrals; the degree to which health facilities; equipment and diagnostic tests facilitate or hinder care once referral has taken place; the role different factors (transport, logistics, etc.) play in the referral process; as well as

cultural beliefs and stigma that affect health seeking behaviour.

Based on a study on COVID-19 patients, about 40% of patients with COVID-19 may have mild disease, requiring outpatient care; another 40% have moderate disease that may require inpatient care; 15% of patients will have severe disease that requires oxygen therapy or other inpatient interventions; and about 5% have critical disease that requires mechanical ventilation [21]. As we have observed in some countries, the outbreak has shown a higher proportion of severe and critical cases, and doubling rates of cases every 3 days [22]. In COVID-19, which is highly contagious and potentially lethal, appropriate referral plays a crucial role.

An effective referral guideline ensures a close relationship between all levels of the health care system; and helps to ensure people receive the best possible care, closest to home, and at affordable cost. Many patients who reach secondary facilities could be appropriately cared for at primary health care centres. It is essential to develop simple flow charts, depicting referral protocols which can be easily followed.

Referrals of COVID are not only between lower and higher-level facilities, but also between primary facilities, as well as within hospitals. To be effective, referral should be a two-way process that requires coordination and information exchange between the referring facility and the first referral hospital.

General public are not aware where they have to visit when they develop symptoms of COVID-19. There is a confusion regarding the health facility to be visited. A suspected patient sometimes ends up directly in designated COVID treatment facility, rather than fever screening centres [23]. There is no clarity as to where to seek primary health care from.

The design and functioning of a referral guideline depends on health systems determinants such as capabilities of lower level health facilities; availability of specialized personnel; training capacity; organizational arrangements; cultural issues, political issues, and traditions along with socio economic determinants, such as population size and density; terrain and distance between urban centres; pattern and burden of disease; demand for and ability to pay for referral care [24].

Training and capacity building of all health care professionals ranging from Accredited Social Health Activist (ASHA) worker and Anganwadi worker at village, Auxiliary Nurse Midwife (ANM) at subcentre level, medical officer and staff nurses at primary health centre; to lab technicians and specialists at referral centres. Since it's a novel disease and guidelines keep changing, it's crucial to update health professionals in a timely fashion. Lengthy and too much information may not reach them; hence emphasis should be made on simplifying the referral guidelines.

There needs to be mandatory disclosure of local authorities' in-charge and centres in-charge for each area to take care of COVID symptoms [25]. In most places contact information of district level officials is circulated among population, this may not serve the purpose of appropriate referral.

Due to the lock down, people are facing problems in moving from one place to another. There are designated ambulances for COVID transport and other ambulances for non COVID patients. Ambulance drivers need to be sensitized about the referral guidelines and also their personal protection.

Signages are important at every point, clear direction towards appropriate COVID care facility or designated COVID treatment centres. Even at centres, correct signage will help patients to approach correct area of treatment or else there are chances of this

person being a super spreader of COVID infections.

Conclusion

Current evidence regarding health care suggests that there is lack in continuity of care and disruption in the routine health care services from the last 3 months. Though certain efforts such as home delivery of healthcare like field testing for COVID-19 infected containment zones, has helped us to track and trace COVID-19; and making use of the existing health care system was very appropriate in relation to combating the pandemic. The primary health care services had challenges in providing essential health care as the focus shifted to COVID-19. Standard-operating protocols (SOPs) on digitalization and telemedicine were introduced in no time, to reach people at periphery and the agony of the people was addressed. However, referral and SOPs of COVID-19 were not aptly made, so reaching out the population and reduction of mortality which should have been the motto was lost. As reporting of other health issues was not prioritized, the available services were also not documented and it seems there was a major lack in protocol. The evidence till date speaks about confusions in health care during COVID-19, thus there is need of corrective measures to immediate effect. Indian health system needs to concentrate on building of its health care delivery system and should be prepared to combat the unexpected pandemics in future.

India has an extensive network of about 25,000 primary health centres and 5,300 community health centres, spread across all regions and states. In addition, large numbers of private and non-governmental organizations provide primary healthcare in urban and rural areas. At this juncture, they can play a critical role in managing the epidemic and providing continuity of services. An investment in strengthening primary healthcare at these times will also go a long way in rejuvenating and creating resilient health systems [18].

Every state should develop a website and upload all the recent guidelines given by national and international organizations and different types of centres; how to reach them, and transport persons contact details in local understandable language. There are many applications which are used for various purposes of COVID care, an integration of all apps and development of single user friendly application is recommended.

Appropriate guidelines for symptom identification, laboratory referral and notification of the disease should be mandated. We need to encourage the use of telemedicine for the same which can help in reducing the disease spread and containment.

References

1. Nita M, Oppenheim B, Gallivan M, Mulembakani P, Edward R, Wolfe N. Pandemics: Risks, Impacts, and Mitigation. In: Jamison DT, Gelband H, Horton S, et al., editors. Disease Control Priorities: Improving Health and Reducing Poverty. 3rd edition. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2017 Nov 27. Chapter 17. Available from: https://www.ncbi.nlm.nih.gov/books/NBK525302/ doi: 10.1596/978-1-4648-0527-1_ch17
2. Anu Grover. Long-term Impact of COVID-19 Pandemic on Healthcare Scenario in India. Express Pharma (online). 2020April 14;Business associar-consulting. Accessed on 2020 April 25. Available from: https://www.expresspharma.in/amp/guest-blogs/long-term-impact-of-covid-19-pandemic-on-healthcare-scenario-in-india/
3. Primary health care; WHO fact sheets, Health topics. Accessed on 15 May

2020. Available from: https://www.who.int/news-room/fact-sheets/detail/primary-health-care.
4. Cohut M. How the pandemic has affected primary healthcare around the world. Newsletter. Medical NEWS today (online). May 2020; COVID-19: Latest news and resources. Accessed on 2020 May 16.Available from https://www.medicalnewstoday.com/articles/how-the-pandemic-has-affected - primary-healthcare-around-the-world#Impact-on-expectant-parents)
5. Rust G, Melbourne M, Truman BI, Daniels E, Fry-Johnson Y, Curtin T. Role of the primary care safety net in pandemic influenza. Am J Public Health. 2009;99:S316–23.
6. Lee A, Chuh AA. Facing the threat of influenza pandemic - roles of and implications to general practitioners. BMC Public Health. 2010;10(1):1–7
7. Framework for Healthcare Systems Providing Non-COVID-19 Clinical Care During the COVID-19 Pandemic. Center for disease control and prevention.2020 May 12; Coronavirus disease 2019 (COVID-19). Accessed on 2020 May 16. Available from: https://www.cdc.gov/coronavirus/2019-ncov/hcp/framework-non-COVID-care.html
8. Rukmini S. How covid-19 response disrupted health services in rural India. (e-paper).Livemint.27 April 2020. Accessed on 2020 April 30.Available from https://www.livemint.com/news/india/how-covid-19-response-disrupted-health-services-in-rural-india-11587713155817.html
9. Lewis C, Seervai S, Shah T, Abrams MK, and Zephyrin L. Primary Care and the COVID-19 Pandemic. The Commonwealth fund. 2020 April 22. Accessed on 2020 April 30. Available from https://www.commonwealthfund.org/blog/2020/primary-care-and-covid-19-pandemic
10. Anantkumar K, Rajasekharan N, Shaffi FK et al. COVID-19: Challenges and its consequences for rural health care in India: Editorial. Public Health in Practice. 1 (2020) 100009
11. Mathew S. What the Covid-19 pandemic means for the doctors at the frontline. The Hindu (e-paper) 2020 March 22; Coronavirus Health. Accessed on 2020 April 20. Available from: https://www.thehindu.com/sci-tech/health/what-the-covid-19-pandemic-means-for-the-doctors-at-the-frontlines/article31135013.ece
12. Farid H, Memon B. Pregnant and worried about the new coronavirus? Harvard health publishing.Harvard Medical School2020 March 15; Harvard Health Blog. Accessed on 2020 April 25. Available from: https://www.health.harvard.edu/blog/pregnant-and-worried-about-the-new-coronavirus-2020031619212
13. UN News, Global perspective human stories, Millions more children at risk with immunization services disrupted amid COVID-19 pandemic published on 26 April 2020 available from https://news.un.org/en/story/2020/04/1062622
14. Yemi L. Over 13 million children globally did not receive vaccines – even before Coronavirus disrupted immunisation – UNICEF. UNICEF-UK.2020 April 25; Media contact and press release. Accessed on 2020 April 27. Available from: https://www.unicef.org.uk/press-releases/over-13-million-children-globally-did-not-receive-vaccines-even-before-coronavirus-disrupted-immunisation-unicef/
15. Parpia AS, Ndeffo-Mbah ML, Wenzel NS, Galvani AP. Effects of Response to 2014-2015 Ebola Outbreak on Deaths from Malaria, HIV/AIDS, and Tuberculosis, West Africa. Emerg Infect Dis. 2016;22(3):433-441. doi:10.3201/eid2203.150977

16. WHO Director-General's opening remarks at the media briefing on COVID-19. World Health Organisation. 13 May 2020; WHO Director-General's speeches.Accessed on 2020 May 16. Available from: https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---13-may-2020
17. WHO and UNICEF to partner on pandemic response through COVID-19 Solidarity Response Fund. World Health Organisation.2020 April 03; Newsroom. Accessed on 2020 April 25. Available from: https://www.who.int/news-room/detail/03-04-2020-who-and-unicef-to-partner-on-pandemic-response-through-covid-19-solidarity-response-fund
18. Mohan P,Mor N. Covid-19 crisis: Shift focus from hospitals to primary care. The Hindu (e-paper).07 April 2020;Opinion. Accessed on 2020 April25; Business Line. Available from: https://www.thehindubusinessline.com/opinion/covid-19-crisis-shift-focus-from-hospitals-to-primary-care/article31278485.ece
19. India under COVID 19 lock down: Editorial. The Lancet. 2020 April 25;395(10233):p-1315. Available from: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30938-7/fulltext
20. Resources; Awareness material on COVID-19. Ministry of Health and Family Welfare, Government of India. Accessed on 15 May 2020. Available from: https://www.mohfw.gov.in/
21. Wu Z, McGoogan JM. Characteristics of and important lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases from the Chinese Center for Disease Control and Prevention. JAMA. 2020. doi: 10.1001/jama.2020.2648. [Epub ahead of print]
22. Ministerodella Salute. Nuovo coronavirus: Cosac'è da sapere. Accessed on 18 March 2020. Available from http://www.salute.gov.it/portale/documentazione/p6_2_8.jsp?lingua=italiano.
23. Guidelines out for non-coronavirus health facilities, National Herald, PTI, Published: 21 Apr 2020. Accessed from https://www.nationalheraldindia.com/national/guidelines-out-for-non-coronavirus-health-facilities
24. Referral guidelines for health facilities in Uttar Pradesh, Directorate of Medical & Health Services, Uttar Pradesh, Department Of Medical, Health & Family Welfare, Lucknow. Accessed from http://www.dgmhup.gov.in/en/Referral_Guidelines
25. SOP on preventive measures to contain spread of COVID-19 in office. Government of India Ministry of Health & Family Welfare. 2020 June 4. Accessed from https://www.mohfw.gov.in/pdf/1SoPstobefollowedinOffices.pdf

-----*-----