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STRATEGIC RESILIENCE: PAKISTAN'S COMPREHENSIVE APPROACH TOWARDS COMBATTING AND ADAPTING TO THE CHALLENGES OF COVID-19

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Abstract

The global consequences of COVID-19 extend beyond borders, race, and ethnicity, posing significant health challenges universally. While all countries grappled with the pandemic, underdeveloped nations faced heightened risks due to constrained financial and health infrastructure. The ongoing crisis has unpredictably tested societies, imperiling humanity, and global resilience. This situational analysis, conducted by the authors, involved data collection from the World Health Organization's COVID-19 website and Pakistan's Directorate of Central Health Establishments between February 2020 to March 2022. The study also encompassed a thorough review of recent articles, literature, news alerts, and publicly available data on COVID-19 in Pakistan. In response to the pandemic, Pakistan devised a comprehensive strategy, featuring a national action plan, the establishment of the national 1166 helpline, thermal screening, and active case finding at entry points, and the reinforcement of a surveillance system for contact tracing and case-based monitoring. This crisis has significantly impacted the mental health of healthcare workers and disrupted education, particularly in rural areas. Despite these challenges, a positive environmental outcome emerged as air quality improved during the lockdown.

Keywords: *Corona, Covid-19, strategist approach, Pakistan, vaccine, Preventive measure*

INTRODUCTION

In past due December 2019, a pneumonia outbreak occurred in Wuhan, Hubei province, China, and spread quickly nationwide (1). Now formally referred to as excessive acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (2). The official names COVID-19 and SARS-CoV-2 were issued by the WHO on 11 February 2020 (3). On 30 January 2020, the Director-General of WHO stated that the outbreak of novel coronavirus (2019-nCoV) constitutes a public health emergency of international concern (PHEIC) as per the advice of the International Health Regulations Emergency Committee (4). On 11 March, WHO declared the Novel Corona Disease outbreak as a pandemic (5). Due to the COVID-19 pandemic, numerous challenges were faced by the population such as shelter, health, education, etc. The number of confirmed cases and deaths kept fluctuating with different variants of COVID-19. This article focuses on some important issues like government guidelines, case studies, and the direct and indirect effects of COVID-19.

CASE STUDY FROM 26 FEBRUARY 2020 TO 14 MARCH 2022

1st WAVE (EARLY 2020)

On 26 February 2020, a laboratory-confirmed 8 cases of COVID-19 were reported in Karachi (6). On 2 March 2020 2 more cases were reported as confirmed cases. As of March 9, a total of 46 confirmed cases. On 16 March 2020-total 590 confirmed,3 Deaths, On 23 March 2020-total 880 confirmed,10 deaths, On 13 April

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2020-total 2955 confirmed (7), 73 deaths, On 18 May 2020-total 14,450 confirmed, 260 deaths, On 1 June 2020-total 29,447 confirmed, 519 deaths, On 22 June 2020-total 37,387 confirmed, 617 deaths, On 6 July 2020-total 20,398 confirmed, 485 deaths, On 3 August 2020-total 4,422 confirmed, 106 deaths, On 7 September 2020-total 2,972 confirmed 37 deaths, On 5 October 2020-total 4,316 confirmed 57 deaths, On 16 November 2020-total 17,047 confirmed 494 deaths, On 7 December 2020-total 21,865 confirmed 421 deaths. Different strategies were enforced by the government to reduce the spread of the virus including:

- Closing schools and universities
- Suspending non-essential travel
- Implementing mask mandates
- Closure of markets

2nd WAVE (2021)

On 4 January 2021-total 15,155 confirmed 340 deaths, On March 2021-total 13,808 confirmed 310 deaths, On 5 April 2021-total 33,080 confirmed 632 deaths, On 26 April 2021-total 35,503 confirmed 958 deaths, on 10 May 2021-total 20,511 confirmed 670 deaths, On 9 August 2021-total 31,574confirmed 542 deaths, On 20 September 2021-total 15,627 confirmed 389 deaths, On 1 November 2021-total 3,895 confirmed 79 deaths.

3rd WAVE (2022)

On 10 January 2022-total 17,634 confirmed 41 deaths, on 7 February 2022-total 25,693 confirmed 283 deaths, on 14 March 2022-total 3,430 confirmed 24 deaths, complete data shown in Fig. 1 (8).

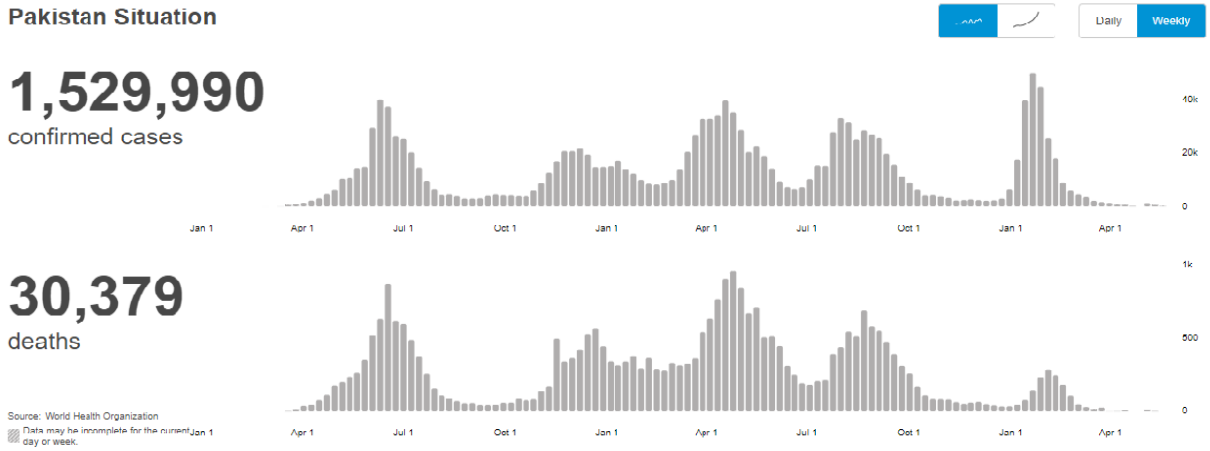

Fig. 1. WHO Coronavirus (covid19) dashboard

Pakistan, a middle-income country with a large population of around 197 million and limited healthcare resources, faced significant challenges in addressing the COVID-19 pandemic (9). Pakistan struggled with a severe shortage of doctors and paramedical staff among its expanding population. With an estimated 79,000 registered doctors in Punjab, 65,000 in Islamabad, 22,000 in Sindh, 5,000 in K-PK, and 4,100 in Baluchistan, the country's limited infrastructure and human resources posed a formidable challenge in controlling or slowing the spread of COVID-19. Moreover, a significant portion of the population lacked health insurance or social security, further exacerbating the healthcare crisis (10). The shortage of ventilators was a great challenge. Unfortunately, many people in Pakistan seemed unconcerned about following safety guidelines, acting as if they were immune to the virus which became a major challenge. They openly ignored government orders, downplayed the seriousness of the pandemic, and took preventive measures lightly. They wasted valuable time by indecisively changing their minds and actions instead of taking decisive steps. After a brief period of restrictions, many unmasked and unloved people were seen violating lockdown rules, recklessly disregarding all precautions (11).

Despite the incomplete implementation and inconsistent adherence to standard operating procedures (SOPs), Pakistan's COVID-19 infection rate remained lower than anticipated. The COVID-19 pandemic has imparted several valuable lessons to Pakistan, emphasizing the importance of robust public

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health infrastructure, effective risk communication, enhanced surveillance, and collaboration at all levels. The pandemic also highlighted the crucial role of community engagement, social support, preparedness, international cooperation, economic resilience, mental health support, and science-based policymaking in effectively addressing public health challenges (12).

GOVERNMENT INITIATIVES

The COVID-19 pandemic has arisen as an overwhelming challenge and it has disturbed the worldwide economy, communal, and medical care frameworks in 2020. Self-quarantine and social distancing are the main accessible solutions for limiting the spread of the coronavirus (4). There were no possibilities left for the government but to enforce a lockdown. The government of Pakistan implemented some mandatory precautionary measures such as wearing a face mask in public became compulsory. People must keep a social distance of 6 feet among them. It was advised to avoid crowded places. Public events were not allowed because it was the major cause of COVID-19 spread as it spread from person to person. All the education system was converted to an online learning system. All the business institutes and their workers kept working from home. Foreigners were prohibited from entering the country. The "Sehat Tahaffuz" helpline 1166, a toll-free service launched on February 6, 2020, seeks to address the unmet needs of Pakistan's citizens in the realm of health information and services especially related to COVID-19 (13). In response to the COVID-19 pandemic, the Prime Minister's COVID-19 Relief Fund was established in 2020 to provide financial assistance to those affected by the crisis (14). To further support vulnerable communities, the Corona Relief Tiger Force, a volunteer initiative, was launched to assist the government in distributing food aid and raising public awareness about the pandemic. The COVID-19 relief fund was established by the government of Pakistan to get donations for the welfare of the public. The Ehsaas program, a cornerstone of Pakistan's social safety net, offered crucial assistance to vulnerable populations during the COVID-19 pandemic (15). The government of Pakistan launched different social network helplines in seven languages for the assistance of the Public. The National Emergency Response app was also launched by the government (16). With the backing of UNHCR *(United Nations High Commissioner for Refugees*), the Baluchistan Task Force developed IEC (Information, Education, and Communication) material in Dari and Pashto languages. These materials were distributed in Baluchistan (17).

Precise hospitals were approved for the supervision of suspected and definite cases of COVID-19 based on the accessibility of quality isolation wards at the Federal, and provincial levels. Each institute and hospital is likely to conduct a need and accessibility valuation of supplies. For the treatment and management of waste at hospitals, Standard Operating procedures were developed by the Government. Local SOPs were followed, and appropriate training staff were assigned to handle waste at hospitals and airports. Decontamination and environmental sanitization SOPs were also established. Isolation wards were constructed all over Pakistan to treat and handle COVID-19 patients. In KPK 33 districts were assisted with 110 medical facilities functional. 34 districts of Punjab were facilitated with 50 medical facilities serviceable. Sindh province was facilitated with 4 medical facilities in its 4 districts. In Gilgit Baltistan, 10 districts were helped with 21 medical facilities. 9 districts of Jammu Kashmir were provided with 15 medical facilities. These numbers kept changing with the number of positive cases. The government of Pakistan established various social media platforms for public awareness about COVID-19 spread and precautionary measures to keep themselves safe (18). The vaccination process became compulsory for everyone in the country. UNICEF (United Nations International Children's Emergency Funds) worked closely with the Ministry of National Health Services and Regulations to support the COVID-19 emergency. Huge support was provided by UNICEF (United Nations International Children's Emergency Funds) to the governments to reduce virus transmission by promoting safety and health measures. Now UNICEF (United Nations International Children's Emergency Funds) is supporting the COVID-19 vaccination campaign. Almost one million cases of COVID-19 were reported in Pakistan. Special vaccination centers were established in each Government hospital throughout the country. To facilitate the public, several vaccination campsites were also established places away from these hospitals. Pfizer (United States), Sinopharm (China National Pharmaceutical Group

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Corporation), Sinovac (China), CanSino-Bio(China), and Sputnik (India, China, Brazil)doses have been directed in Pakistan (19).

COMMON PREVENTIVE MEASURES

Numerous preventive measures have been advised for public health. Coronavirus has the transmission method of person-to-person by contact, and by coughing which produces specifically infected aerosol in the air which can affect other persons. As per the guidelines of WHO, Cleaning of often touched surfaces like daily used items (e.g., door knobs, Switches, Toilets, handles, tables, and chairs) and complete hand washing is necessary and recommended (20). Due to poor knowledge, frequent use and exposure to disinfecting chemicals caused severe respiratory illness including asthma and allergic reactions in humans. Due to this, it is not advised to frequently use disinfectant chemicals during the COVID-19 pandemic as it is confusing with the novel coronavirus symptoms. Social distancing became a necessary and effective measure to restrict the spread of infection. It was advised to maintain a distance of at least six feet and avoid touching the surface of our nose, eyes, and face with unwashed hands. Self-quarantine and keeping a distance from sick people can protect from virus spread. Covering the face with an arm/elbow, when coughing and sneezing can protect other people from exposure to infectious droplets present in the air. Often and whole hand hygiene proved to be the most important method to be used to restrict infection of Coronavirus. SARS-CoV-2 contains a viral envelope and makes it potentially vulnerable to substances with surface activity, such as alcohol and soap. Using hand sanitizers that contain 60-90% in the absence of soap and water is another important preventive measure (Fig. 2) (20).

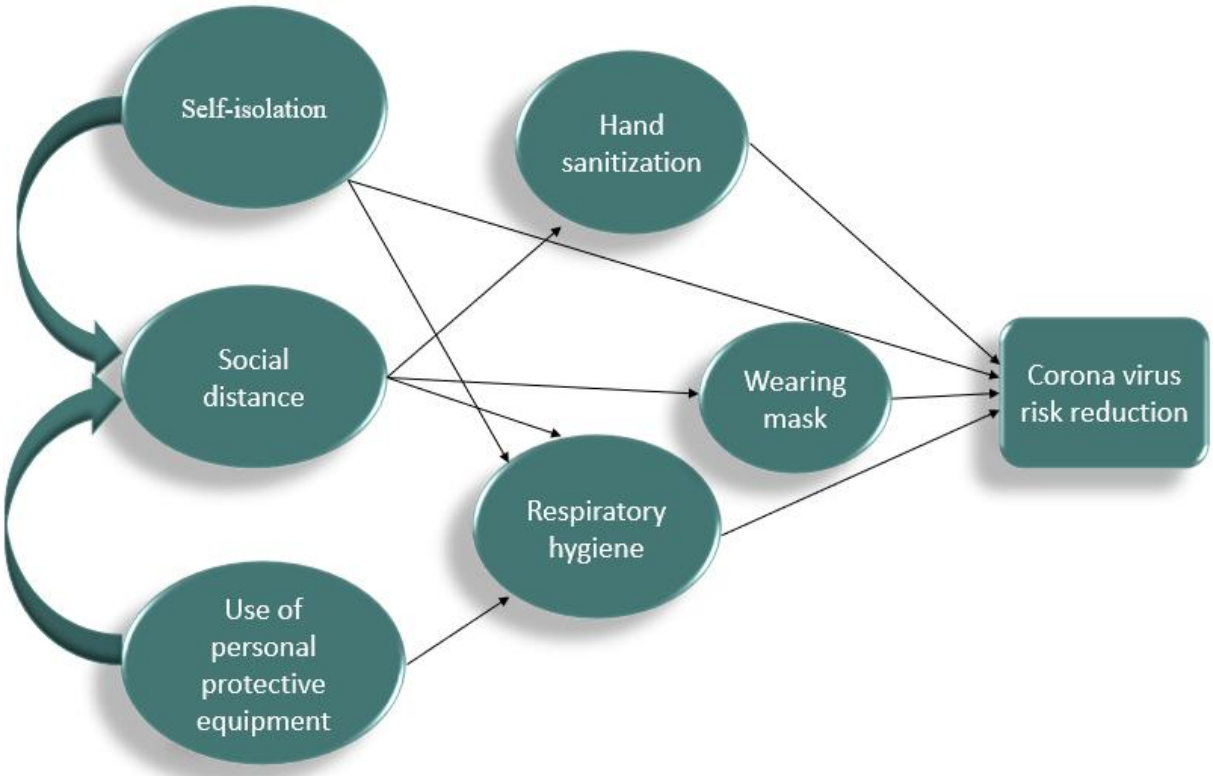

Fig. 2. Common preventive measures for COVID-19

TREATMENT OF COVID-19

In the initial stages of the COVID-19 spread, there was no efficient treatment for it but the forms of drugs that were mostly used comprised antiviral agents, inflammation inhibitors, and plasma. The rapid spread of COVID-19 leads to the immediate need for therapeutic intervention. COVID-19 at its early stages with mild symptoms can be treated at home by getting rest and taking medicines to relieve fever and pain. Two pills were authorized by the FDA to treat COVID-19. FDA (Food and Drug Administration) authorized an oral antiviral pill, called PAXLOVID**.** These two pills were suggested to treat mild-to-moderate COVID-19. Self-isolation was one of the most beneficial treatments for mild COVID-19 patients. Patients with severe

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conditions were treated with different anti-viral drugs. FDA approved another drug to treat patients with severe illness due to COVID-19 and admitted to hospitals, called REMDESIVIR. It was the first medicine to be approved for COVID-19 severe cases. It was created against the Ebola virus in the past, but the FDA issued an emergency use ruling. The combined effect of hydroxychloroquine and AZITHROMYCIN was approved to be effective against COVID-19. Different nucleoside analogs were also discovered for the treatment of COVID-19 (21). PLAZMA from convalescent patients was being entertained as a possible treatment option. It acts as a neutralizing or immunomodulatory agent (22). Corticosteroids which exhibit the ability to suppress lung inflammation were also considered as a treatment option for COVID-19. The administered dosage of methylprednisolone varied depending on the severity of the disease (23).

DIRECT AND INDIRECT EFFECTS OF COVID-19

IMPACT ON PAKISTAN'S ECONOMY

Before the onset of COVID-19, it was claimed by PM Imran Khan that the economy of Pakistan had been established. On 2 January 2020, he claimed 2019 as the year of growth, development, and wealth creation. A week after this statement of PM Khan, a press conference was arranged by the finance minister of Pakistan declaring that the economy was moving progressively and on its stabilization process. He claimed the recovery of Pakistan's economy towards the end of 2020. Several accomplishments were reached in the initial five months including the CAD (Current account deficit) dropped by almost 73%, and the fiscal shortfall was at 1.6 % of GDP. The primary steadiness was at 0.3 % of GDP. Credit rating was improved to stable. The business index improved from 13 to 108. In December 2019, Pakistan's credit outlook was upgraded, and it was upgraded from negative to stable. There was an increase in foreign investment, tax, and non-tax revenues, and exports. Large-scale manufacturing was showing positive signs. SEMs were stabilizing (24).

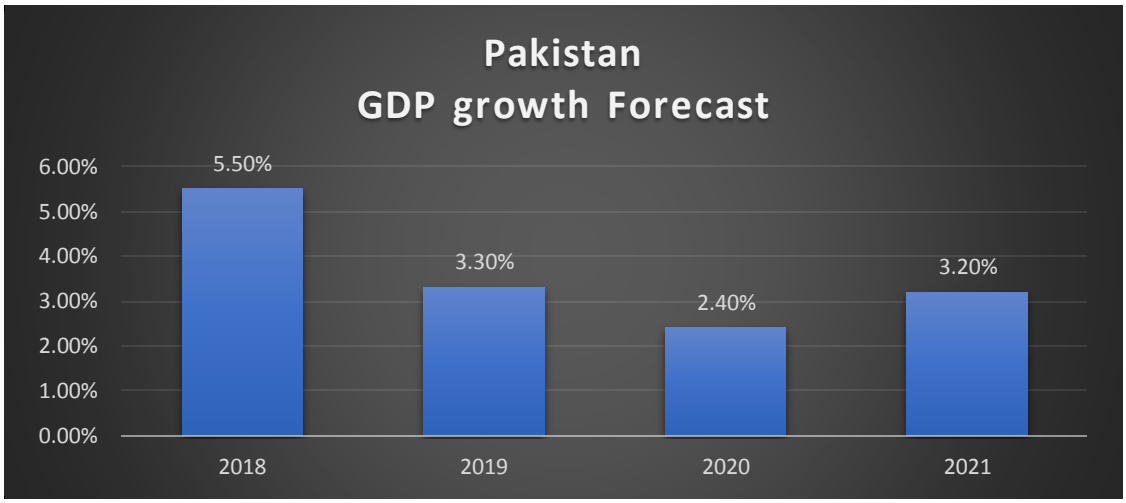

Fig. 3. Pakistan's GDP growth during the year 2018 – 2021

The economy of Pakistan was affected badly during the rapid spread of the COVID-19 pandemic due to lockdowns in almost all cities. The closure of nonessential businesses and domestic supplies exhibited a significant impact on wholesale trade and transport. Pakistan was also placed among the countries that faced the hardest hit in the global pandemic by UNCTAD (United Nations Conference On Trade and Development) (25). There was a direct impact of COVID-19 on SMEs (Small and Medium-sized enterprises) in Pakistan. Pakistan's 90% of business constitutes SMEs. It contributes 40% of the National GDP. Many small-scale businesses met closure due to the pandemic (26). Pakistan is an agrarian country and the majority of people depend on agriculture. 43% of the employment share is provided by agriculture. During the COVID-19 pandemic, the economic growth of Pakistan was -1%. Most of the people were unemployed during this period. It badly affected the people who were living from hand to mouth (24). There was a 1.3 trillion loss to the economy of Pakistan. Pakistan's one-third population has already been living below the poverty line, this number increased by over 40% during the pandemic. A negative spillover was faced by Pakistan as exports faced cancellation of orders due to the plunged demand for textiles in the world. There

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was a 44-million-dollar spillover from the Chinese economy alone upon Pakistan's textile sector (27). There was a 70% reduction in CAD (Current account deficit) resulting from import compression and depreciation in the Pakistani rupee. Pakistan's GDP growth fell from 505 to 3.3 % in 2019 and IMF anticipated it to further decrease to about 204% in 2020 (Fig. 3).

IMPACT OF COVID-19 ON THE EDUCATIONAL STRUCTURE OF PAKISTAN

The COVID-19 pandemic directly affected the education system in Pakistan. Pakistani students faced a lot of difficulties. The closure of all educational institutes led to the loss of students. Pakistan was listed among the primary nations in the world for its extensive close educational institutes. According to the research, school closure during the pandemic resulted in a loss between 0.3 and 0.8 years of learning-adjusted schooling for an average student. It also affected the university students as well. The exams of many institutes were canceled, but it empowered the online learning system as well. Students of regular universities face difficulties in the online mode of learning (28). It affected the students of rural areas of Pakistan as these students were unable to get all technological facilities. Technology without equity among all our children/students never led to efficient learning. Online learning was well received by the O and A level students but not all schools can afford to offer online learning. Schools in rural areas and villages were unable to provide digital content as they lacked such technologies. Despite gaining momentum, online education faced several challenges that prevented it from becoming a permanent alternative to traditional classrooms. The lack of adequate IT infrastructure, particularly in smaller educational centers, posed a significant barrier. Additionally, the drastic shift to online schooling risked exacerbating the literacy gap among low-income families, districts, and developing nations, as online education often favored privileged communities with better access to technology and resources. Furthermore, the absence of a conducive home environment, parental involvement, and financial constraints led to irreparable learning losses for underprivileged children. Pakistan's online education system faced logistical hurdles such as unstable electricity, limited internet access, a shortage of digital devices and technical expertise, and cybersecurity concerns. Moreover, the prevalence of load shedding in rural areas further diminished the effectiveness of television-based online learning initiatives. Additionally, there were concerns regarding the potential use of online learning systems to reduce teacher employment post-pandemic. Lastly, online education often sacrificed valuable social interactions and extracurricular activities that contributed to a holistic educational experience (29). On the other hand, mobile phones and secure internet connections became necessary for the students. Digital communication system and e-learning was not the priority of Pakistan's population. Technology without equity among all our children/students never led to efficient learning. Online learning was well received by the O and A level students but not all schools can afford to offer online learning. Schools in rural areas and villages were unable to provide digital content as they lacked such technologies. On the other hand, mobile phones and secure internet connections became necessary for the students. Digital communication system and e-learning was not the priority of Pakistan's population. The COVID-19 pandemic period was a difficult time for educational institutions as well. Many universities have struggled with unpredictable futures. Schools, colleges, and universities were under high pressure to pay the faculty. Almost a decline in academic production and new rules stretched the university's budget. Students were also unable to bear the expenses of the online learning system and faced a lack of facilities as well (30).

AN INDIRECT IMPACT OF COVID-19 ON AIR POLLUTION

According to Pak-EPA (Pakistan Environmental Protection Agency), in February 2020, before the imposition of the COVID-19 lockdown maximum monthly average of $PM_{2.5}$ recorded was 56.59 μg/m³. It then reduced to 4.16 μg/m³. (EPA yearbook 2019-2020) (31). COVID-19 affected the environment indirectly, air pollution decreased during the lockdown situation in the country. Many services were restricted by the government including transportation and industrial and agricultural production which were the main cause of air pollution. While the COVID-19 pandemic exhibited a lot of negative impacts globally, some positive impacts were observed on air quality. Pakistan was listed among the top five countries with the most polluted air quality. During the pandemic, considerable air quality changes were observed (32). In

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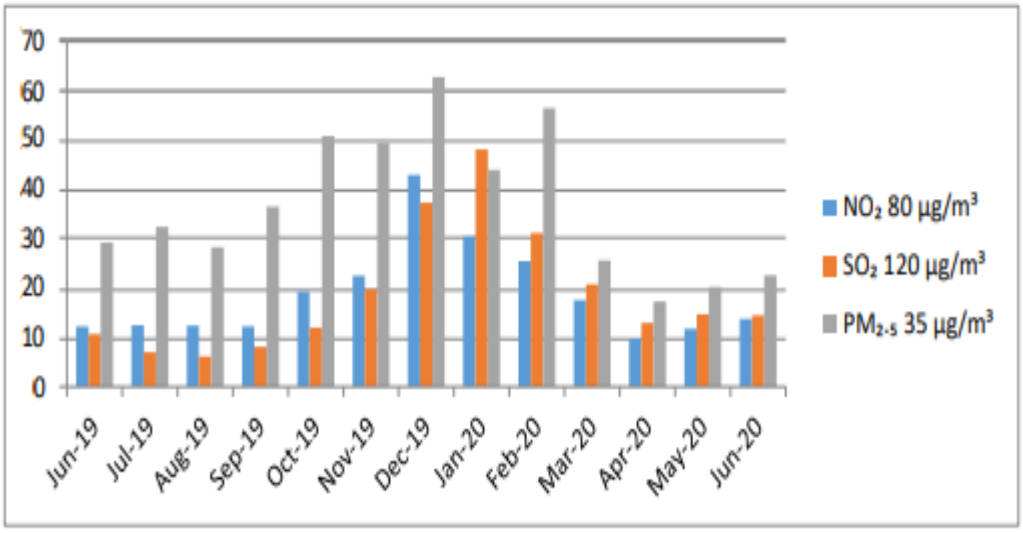
Islamabad, $PM_{2.5}$ concentrations were reduced by between 30-35%. According to the EPA yearbook 2019-2020, the $PM_{2.5}$ value was reduced to a single-digit value which was 4ug/m3 in the time due to the closure of all education institutes, and offices which resulted in low traffic. Large vehicles are the major cause of air pollutants that faced closure during the pandemic. In Islamabad, air from fixed air quality stations was analyzed by Pak EPA. They analyzed the air pollutant concentration during the partial lockdown. There was a positive impact of the partial lockdown on the air quality of Islamabad. Pak EPA (*Environmental Protection Agency*) observed a drastic reduction in $PM_{2.5}$ (up to -40.2, -42%), compared to the observation of February 2019. On 24th June 2020, there was still limited transport, construction work, and functional industries which resulted in reduced pollutants as well. $PM_{2.5}$ value was still (22.74 µg/m³) (31). In comparison to the years 2018 and 219, Nitrogen dioxide particulate matter and Sulphur dioxide levels declined during the lockdown period (June 2019- June 2020) (Fig. 4).



(June 2019- June 2020)

Fig. 4. Monthly average of main air quality parameters during COVID-19 outbreak

IMPACT ON THE PSYCHOLOGICAL HEALTH OF HEALTH CARE WORKERS

Public health emergencies threatened the security, health, and well-being of both people and societies which led to a range of emotional reactions such as depression and mental disease. More than 5000 HCWs (Health care workers) were diagnosed with COVID-19 and 58 deaths were reported. According to numerous studies, anxiety sleep problems, and depression were reported in HCWs (Health care workers) due to duties in different medical fields and positions. The COVID-19 pandemic carries a substantial risk of propagating psychological apprehension and distress, often resulting in a myriad of psychological issues, encompassing fear, anxiety, stigma, discrimination, and ostracism directed towards those impacted by the disease, including healthy individuals, vulnerable individuals, and healthcare professionals (33). This situation was more severe for the frontline workers due to the extensive workload and risk of infection. A systematic review was found on the pervasiveness of anxiety and depression among the HCWs. According to this review, depression level in HCWs during the pandemic was as low as 24.1 and 12.1% and as high as 67.55 and 55.89%. A sudden surge in COVID-19 infection and increased death of healthcare workers was worrying. 480 HCPs(health care professionals) were infected by COVID-19 and five doctors died at the beginning of the infection (34). Excessive workload led to the loss of intention and high rates of exhaustion. A higher level of anxiety in physicians was also due to the fear of exposing families and children after returning home and due to isolation. Operating under immense pressure, healthcare workers and professionals demonstrate innate adaptive emotional and behavioral responses to extreme, unpredictable, and uncertain stress. Consequently, counseling and psychotherapy rooted in the stress-adaptation model could serve as an early and proactive intervention. Addressing the mental health concerns of medical workers is paramount for enhanced pandemic mitigation and control (35). There isn't any proper investigation of the mental health of HCWs in Pakistan, but recent studies showed that HCWs during a

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COVID-19 outbreak experience higher anxiety due to the insufficient and inadequate protection of HCWs (36, 37).

CONCLUSION

The study on the strategist approach of Pakistan to COVID-19 concludes that effective coordination of program instruments is crucial for a consistent and sustainable recovery from the COVID-19 pandemic. The attitudes of government officials, the public, and particularly public leaders play a critical role in expediting health recovery. Public awareness and collaboration among state and non-state actors significantly impact the effectiveness of policy outcomes. Ineffective policy management and inappropriate policy instruments can render the entire program ineffective in achieving economic, educational, and health goals. The pandemic also highlighted the crucial role of community engagement, social support, preparedness, international cooperation, economic resilience, mental health support, and science-based policymaking in effectively addressing public health challenges. Pakistan, a middle-income country with a large population of around 197 million and limited healthcare resources, faced significant challenges in addressing the COVID-19 pandemic. Pakistan struggled with a severe shortage of doctors, paramedical staff, and medical resources. Pakistani government tried to deal with the pandemic in all aspects despite being an undeveloped country but there is a need to improve all the faults and weaknesses. It can prevent future viral attacks and can reduce the mortality rate. As to talk about the environmental aspect, it affected the environment indirectly in a good way.

Conflict of Interest:

Authors have no conflict of interest.

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