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Review

COVID-19 Pandemic and the Global Perspective of Turkish Thoracic Society

Nurdan Köktürk[1], Bahriye Oya İtil[2], Göksel Altınışık[3], Nalan Adıgüzel[4], Metin Akgün[5], Levent Akyıldız[6], Sedat Altın[7], Hüseyin Arıkan[8], Güngör Ateş[9], Pınar Ay[10], Nilüfer Aykaç[11], Cenk Babayiğit[12], Pınar Bostan[13], Güzin Cinel[14], Haluk Celaleddin Çalışır[15], Pınar Çelik[16], Pelin Duru Çetinkaya[17], Elif Dağlı[18], Ahmet Uğur Demir[19], Canan Demir[20], Öner Dikensoy[21], Ebru Çakır Edis[22], Osman Elbek[23], Münevver Erdinç[24], Begüm Ergan[2], A. Füsun Öner Eyüboğlu[25], Bilun Gemicioğlu[26], Tuncay Göksel[24], Erkmen Gülhan[27], Ökkeş Gültekin[16], Canan Gündüz Gürkan[28], Alev Gürgün[24], Yavuz Havlucu[16], Ozen K Başoğlu[24], Sait Karakurt[29], Zuhal Karakurt[4], Oğuz Kılınç[2], Ali Kocabaş[30], Seval Kul[31], Benan Müsellim[32], Sibel Naycı[33], Metin Özkan[34], Özgün Pınarer[35], Cüneyt Saltürk[36], Abdulsamet Sandal[20], Abdullah Sayıner[24], Elif Şen[37], Gökçen Ömeroğlu Şimşek[2], Bülent Taner Karadağ[38], Fatma Tokgöz Akyıl[7], Zehra Nur Töreyin[39], Eyüp Sabri Uçan[2], Filiz Çağla Uyanusta Küçük[40], Ayhan Varol[41], Yeşim Yasin[42], Tekin Yıldız[28], A. Arzu Yorgancıoğlu[16], Hasan Bayram[43], Turkish Thoracic Society COVID-19 Follow-Up Committee

[1]Department of Pulmonary Medicine, Gazi University School of Medicine, Ankara, Turkey
[2]Department of Pulmonary Medicine, Dokuz Eylül University School of Medicine, İzmir, Turkey
[3]Department of Pulmonary Medicine, Pamukkale University School of Medicine, Denizli, Turkey
[4]Department of Intensive Care Unit- Pulmonary Medicine, University of Health Sciences, İstanbul Süreyyapaşa Chest Diseases Training and Research Hospital, Istanbul, Turkey
[5]Department of Pulmonary Medicine, Atatürk University School of Medicine, Erzurum, Turkey
[6]Clinic of Pulmonary Medicine, Memorial Dicle Hospital, Diyarbakir, Turkey
[7]Department of Pulmonary Medicine, University of Health Sciences, Yedikule Chest Diseases and Chest Surgery Training and Research Hospital, Istanbul, Turkey
[8]Yüzüncü Yıl University, Dursun Odabaş Medical Center, Medical Intensive Care Unit, Van, Turkey
[9]Department of Pulmonary Medicine, Sultan Hospital, Diyarbakir, Turkey
[10]Department of Public Health, Marmara University School of Medicine, İstanbul, Turkey
[11]Clinic of Pulmonary Medicine, Gayrettepe Florence Nightingale Hospital, Istanbul, Turkey
[12]Department of Pulmonary Medicine, Mustafa Kemal University School of Medicine, Hatay, Turkey
[13]İstanbul Bilgi University, School of Health Sciences, İstanbul, Turkey
[14]Department of Pediatric Pulmonology, Ankara Yıldırım Beyazıt University School of Medicine Ankara, Turkey
[15]Respiratory Specialist, Yapı Kredi Health and Retirement Foundation, İstanbul, Turkey
[16]Department of Pulmonary Medicine, Celal Bayar University School of Medicine, Manisa, Turkey
[17]Department of Pulmonary Medicine, University of Health Sciences, Adana City Training and Research Hospital, Adana, Turkey
[18]Pediatric Pulmonologist, Turkish Thoracic Society
[19]Department of Pulmonary Medicine, Hacettepe University School of Medicine, Ankara, Turkey
[20]Clinic of Occupational Diseases, Occupational and Environmental Diseases Hospital, Ankara, Turkey
[21]Department of Pulmonary Medicine, Acıbadem University School of Medicine, Istanbul, Turkey
[22]Department of Pulmonary Medicine, Trakya University School of Medicine, Edirne, Turkey
[23]Clinic of Pulmonary Medicine, Kadıköy Florence Nightingale Hospital, İstanbul, Turkey
[24]Department of Pulmonary Medicine, Ege University School of Medicine, İzmir, Turkey
[25]Department of Pulmonary Medicine, Başkent University School of Medicine, Ankara, Turkey
[26]Department of Pulmonary Disease, İstanbul University - Cerrahpaşa, Cerrahpaşa School of Medicine, İstanbul, Turkey
[27]Department of Thoracic Surgery, Atatürk Chest Diseases and Thoracic Surgery Training and Research Hospital, Ankara, Turkey
[28]Department of Pulmonary Medicine, University of Health Sciences, Süreyyapaşa Chest Diseases and Thoracic Surgery Training and Research Hospital, Istanbul, Turkey
[29]Department of Intensive Care Unit-Pulmonary Medicine, Marmara University School of Medicine, İstanbul, Turkey
[30]Department of Pulmonary Medicine, Çukurova University School of Medicine, Adana,
[31]Department of Biostatistics, Gaziantep University School of Medicine, Gaziantep, Turkey
[32]Respiratory Specialist
[33]Department of Pulmonary Medicine, Mersin University School of Medicine, Mersin, Turkey
[34]Clinic of Pulmonary Medicine, Ankara Memorial Hospital, Ankara, Turkey
[35]Galatasaray University School of Engineering, İstanbul, Turkey
[36]Department of Pulmonary Medicine, İstanbul Yeni Yüzyıl University School of Medicine, İstanbul, Turkey
[37]Department of Pulmonary Medicine, Ankara University School of Medicine, Ankara, Turkey
[38]Department of Pediatric Pulmonology, Marmara University School of Medicine, İstanbul, Turkey
[39]Department of occupational diseases, Health Sciences University, Adana City Training and Research Hospital
[40]Respiratory Specialist, Ankara, Turkey
[41]Clinic of Pulmonary Medicine, Kepez State Hospital, Antalya, Turkey
[42]Department of Public Health, Acıbadem University School of Medicine, İstanbul, Turkey
[43]Department of Pulmonary Medicine, Koç University School of Medicine, İstanbul, Turkey

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Abstract

It has been more than 3 months now since the first case of COVID-19 was reported in Turkey. Globally, the number of confirmed cases and deaths reached 9,653,048 and 491,128 respectively, as reported by 216 countries by June 27, 2020. Turkey had 1,396 new cases, 194,511 total cases, and 5,065 deaths by the same date. From the first case until today, the Turkish Thoracic Society (TTS) has been very proactive in educating doctors, increasing public awareness, undertaking academic studies, and assisting with public health policies. In the present report, social, academic, and management perspectives of the pandemic are presented under appropriate subtitles. During this critical public health crisis, TTS has once again demonstrated its readiness and constructive stance by supporting public health, healthcare workers, and the environment. This review summarizes the perspective of TTS on each aspect of the COVID-19 pandemic and casts light on its contributions.

KEYWORDS: COVID-19 pandemic, Turkish Thoracic Society, social determinants of health, national lung health, clinical trials

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Address for Correspondence: Hasan Bayram, Department of Pulmonary Medicine, Koç University School of Medicine, İstanbul, Turkey
E-mail: hasantoraks@gmail.com

INTRODUCTION

Cultural values passed down over generations identify the characteristics and attitudes of communities and organizations in different circumstances. This cultural difference is the most important distinguishing factor among societies under the same circumstances [1, 2]. The Turkish Thoracic Society (TTS) is a specialist organization of pulmonologists aiming to protect and improve national lung health. The society, since its foundation date, has clearly determined how this aim will be reached through its political perspectives and cultural values. These perspectives frame all the activities of the society [3-7]. To accomplish the aim of "protecting lung health," TTS intervenes in the development of health policies related to the respiratory field, independent from governmental and non-governmental organizations, as framed by its principles and values. As a matter of principle, TTS does not consider "health" solely from a biomedical perspective but sees it in an inclusive manner and cares about the social determinants of health. TTS looks at the causes and treatment of diseases and strives to overcome the present health inequalities that are a result of the social structure. Therefore, when TTS looks at the COVID-19 pandemic, it does not see only the SARS-CoV-2 virus but instead identifies the deadly outcomes of SARS-CoV-2 on the basis of poverty, inequality, marginalization, and the othering.

This virus is called "democratic" because of its characteristic of infecting everyone; however, it is obvious that its destructive fatal outcomes are not equally distributed due to the inequalities present in the society, and it chooses those who are at higher risk of disease and death. Mankind should immediately understand that humanity is just a part of Mother Nature and accept that both global warming and the COVID-19 pandemic are an outcome of a mentality that prefers profit over nature preservation. Therefore, TTS cannot undergrade or devaluate the fight against this pandemic as just an action against a virus. Instead, it considers this as a great window of opportunity to show the mistakes of human civilization and to bring in mechanisms of self-criticism. TTS thinks that the way to get rid of this man-made hell is to create a new utopia of life and future. The cultural values of TTS, which are respect for human life, patient rights, environment, solidarity, cooperation, transparency, accountability, scientific, evidence-based medicine, and coherence to ethical codes of conduct should be the guiding principles of this utopia.

It has been more than 3 months since the COVID-19 pandemic reached Turkey. The confirmed cases and deaths have touched 9,653,048 and 491,128, as reported by 216 countries by June 27th. Turkey has 1,396 new cases, 194,511 total cases and 5,065 deaths by the same date. From the first case until the current situation, TTS has been following the pandemic by producing educational platforms, public awareness, press materials and intellectual support. TTS has also planned a multicenter study that covers over 40 centers from different cities. As the TTS COVID-19 follow-up group, we would like to summarize these inputs in the literature under a paper of perspective.

The Perspective of the TTS in COVID-19 Epidemiological Measures

Case Definitions and Reporting

Clear definition of an "affected case" is crucial for the calculation of attack rate for the epidemiological assessment of a pandemic [8]. The case definition is dependent on the nature of the disease. Although the diagnosis of an infectious disease is confirmed on the basis of culture and serology, in the instances where laboratory tests may not be reliable for the diagnosis, a definition of a "probable case" is required. Moreover, the diagnostic capacity is very limited when the majority of cases are asymptomatic as in the case of COVID-19. The confirmed cases of COVID-19 are defined on the basis of polymerase chain reaction (PCR) positivity. As clinically and radiologically COVID-19 compatible cases may show PCR negativity, The World Health Organization (WHO) has underlined the importance of the "probable case" definition while reporting of COVID-19 related deaths [9, 10]. To overcome the obstacles in morbidity and mortality reporting, epidemiologists have developed excess mortality analysis, which is based on the comparison of present deaths with the previous years [11].

Mortality Reporting of the Pandemic in Turkey

An accurate mortality rate of the current COVID-19 pandemic is crucial. In the United States, more than 100,000 individuals died of COVID-19 by the end of May 2020 [10]. Between March 1, 2020, and April 25, 2020, a total of 505,059 deaths were reported in the United States; 87,001 were excess deaths, of which 56,246 (65%) were attributed to COVID-19 [11]. Several reasons, including undocumented deaths, delayed admissions for emergency cases, exacerbations of chronic diseases, misattribution of COVID-19 deaths to other respiratory diseases, may underestimate the mortality rate of the pandemic [10, 11].

TTS also investigated the excess mortality in selected cities in a preliminary analysis. Weekly death numbers of the first 15 weeks of each year starting from 2016 were documented for the cities of İstanbul and Trabzon using state statistics [12, 13]. Statistical analysis showed a 10% increase in deaths in comparison to the previous 4 years beginning from the 10th week of 2020 in İstanbul, which was statistically significant. Increase in death rate in 2020, calculated by segmented regression analysis for the same dates, was found to be 2.4% higher than 2016, 1.5% than 2017, 1.1% than 2018, and 3% than 2019. At the 15th week of 2020, total deaths reached 2,222, which was recorded to be 1,425 in 2019, 1460 in 2018, 1464 in 2017, and 1,389 in 2016. In the same week, country-wide COVID-19 related deaths reported by the Ministry of Health (MoH) were 624, which was lower than the excess number of deaths for İstanbul (i.e., 800) compared with the previous 4 years. Similarly, the death records in the city of Trabzon showed an increase of 25% in the first 9 weeks of 2020. There was no incident that could explain the increase in deaths, other than the COVID-19 pandemic [14]. Although COVID-19 seems to be the usual suspect, further studies that could explain the reasons of increase in death numbers are needed. Reporting COVID-19 related mortality only for the PCR positive cases and misattribution of COVID-19 related

deaths to underlying diseases may underestimate the size of the pandemic and the precautions to be taken [15]. WHO requests that national authorities report probable and confirmed cases of COVID-19 infection within 48 hours of identification by providing the minimum data set outlined in the "Revised case reporting form for 2019 Novel Coronavirus of confirmed and probable cases" through the National Focal Point and the Regional Contact Point for International Health Regulations at the appropriate WHO regional office. A template for the revised line listing in Excel format with a data dictionary is available. If the outcome of the patient is not available at the first reporting, an update of the line list should be provided as soon as the outcome data become available within 30 days of the first report.

The Perspective of the TTS on COVID-19 Pandemic and Social Determinants of Health

Social determinants of health are a broader set of forces and systems (economic and social policies and political system) that shape the conditions in which people are born, grow, live, work, and age [15]. The living conditions of people are shaped by the distribution of money, power, and resources at the local, national, and global levels. Unequal distribution (social inequality) of these parameters makes particular people and groups vulnerable to diseases (health inequality). Social determinants of health are largely responsible for the inequity in health, which is defined as unfair and preventable differences observed in health status, both within and among countries [15, 16]. Social and economic policies have consequences on whether a child is likely to achieve her/his full potential and live a healthy life or not. Similarly, policies can determine whether one has a chance to stay home during the pandemic and still contract COVID-19 or not.

While the COVID-19 pandemic has ravaged capitalist economies heavily and permanently, it has also resulted in serious shrinking of economies and the intensification and increasing of unemployment, poverty, and other socioeconomic problems. The pandemic has not just overturned market-oriented health systems and caused mass mortality through its worldwide destructive effects, it has also had a devastating impact on every aspect of life such as economy, social security, education, and food production throughout the world. Population explosion, overcrowded residential settlements, and the increasing possibility of coming in closer contact with animals have enabled the ease and spread of zoonotic infections, especially in developing countries. The starting point of the pandemic is interlinked with the tragic effects of capitalist industrialization stemming from the close relationship between the food chain and the livestock industry in particular [17]. Apart from the loss and destruction caused by the disease itself, shutdowns due to the pandemic have resulted in an economic nightmare. People who had no savings and social security, those who worked on daily wages, those who were laid off during this period, those who worked in the service sectors that completely went out of business, those who were already unemployed, and those who were given unpaid time off could have been pushed into an even more frightening nightmare along with the fear of the virus.

Viral infections are not devoid of class distinction. There are vulnerable groups in the society known to be at extreme risk. Those groups include the poor and the deprived, the homeless, residents of elderly care centers and nurseries, people living in prisons and shelters, workers living in bunkhouses, migrant workers who work under poor working conditions, and immigrants. Metropolitan cities are not equitable settings. The virus is spreading rapidly in regions where people have to go outside to work and where the population of workers and the deprived is dense. The dynamic impact of the virus is shaped by class-based inequalities prevalent in the society. Moreover, urban poverty overlaps with race or refugee status in some regions. For instance, the reason why the mortality rates among the African American population are high compared with that of other groups in the United States is a result of the combined effect of race and poverty; black people are, by far, poorer in the United States. The WHO COVID-19 guide prepared with the one-size-fits-all approach might not be appropriate for every country. Each country should constantly analyze the vulnerable segments of the society and fully support those who are at highest risk [18, 19].

This pandemic has reminded us of the importance of the notions we have long forgotten; the importance of the social state, public health and preventive medicine, education, and solidarity. Above all, it has also reminded us that healthcare is not limited to curative services, and preventive care is equally important, if not more. The world should not be the way it was before the days of the pandemic. The main drivers behind the emergence of this virus were the prevailing neoliberal policies [20]. After the pandemic, we should build a new world, or a new pandemic would be waiting at our doorstep.

The Perspective of the TTS: the COVID-19 Pandemic and the Environmental and Climate Problems

Ecosystem balance may be disturbed due to many reasons. Our world has faced the risk of extinction 5 times so far. Human centered design creates a critical evolutionary pressure on earth. The climate crisis is one of the reflections of neoliberalism, and the probable reason for the pandemic caused by the SARS-CoV-2 virus seems to be our relationship with nature that is embodied by the climate crisis due to global warming. Apart from this, pandemics generally originate in regions where food insecurity is present. Attacks on the natural habitats of animals increase the incidence of zoonotic diseases in humans as seen in the first case of the novel coronavirus that was reported in Wuhan, China, in late December 2019. Air pollution also affects pandemics by providing a suitable environment for some viruses and bacteria to thrive. It is well known that air pollution disturbs the cilia in the respiratory system. As a result, people living in regions with high air pollution are at a greater risk of respiratory tract infections. Furthermore, diseases which are associated with air pollution such as hypertension, diabetes mellitus, atrial fibrillation, and chronic renal failure are risk factors for the severity of COVID-19. Particulate matter smaller than 2.5 mm ($PM_{2.5}$) and 10 mm (PM_{10}) in aerodynamic diameter and pollutants such as sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and ozone (O_3) negatively affect the respiratory system and increase the susceptibility to viral infections as well as the severity of the disease. In a

Chinese study, it was reported that increase in $PM_{2.5}$, PM_{10}, NO_2, and O_3 levels were associated with a 1.76-6.94 times increased risk of COVID-19 infection [21]. Another study from the United States found that deaths related to COVID-19 increased by 15% with every 1 μg/m^3 increase in $PM_{2.5}$ levels [22]. Interestingly, COVID-19 pandemic decreased the global air pollution rate by 6% by decreasing industrial activities and traffic. In a report published by the Chamber of Environmental Engineers, even on days of weekend curfew, the daily $PM_{2.5}$ and NO_2 levels exceeded the limit values in İstanbul [23]. They reported that the measures taken against the COVID-19 outbreak led to the decrease in levels of air pollutants induced by traffic and industry, but this improvement in air quality was "temporary and misleading." Therefore, it will be erroneous to say that the air is cleaner during the pandemic in İstanbul where 60% of all cases are seen, and social interactions are reduced by curfews [24]. A temporary decrease in air pollution in various parts of the world has no significant effect on the climate crisis.

CO_2 in the atmosphere, which has caused climate change throughout the history of civilization, was between 270-285 ppm (parts per million) until 150 years ago. It increased rapidly after the industrial revolution, and while it was 350 ppm in 1,885, it exceeded 400 ppm in 2010 and was 417.70 ppm in 2020 [25]. The increase in the ratio of greenhouse gases in the atmosphere such as CO_2 during the pandemic also shows that the, fight against climate change should be continued with more comprehensive measures for a long time. It has been shown in various studies that deforestation due to industrial agriculture and animal husbandry activities, soil and water pollution, loss of biodiversity, deterioration of ecological balance, increased contact between animals and human beings as a result of encroaching the habitats of animals, and high temperatures due to climate crisis facilitate the spread of infectious diseases.

TTS prioritizes environmental problems since it places more emphasis on the causes of the disease than the disease itself and considers preventive medicine a responsibility [4]. TTS, therefore, established the TTS Air Pollution Task Force and declared its Environmental Policy in 2015 [26]. Humankind is just a piece of Mother Nature, and it is not possible to separate nature and human beings. COVID-19 has showed us very painfully, and with unimaginable loss, that if we damage the natural balance of life, even a very small virus could be life threatening. It is not only a health threat but causes a global recession in economics, politics, and social life. Therefore, the best inheritance for our children is a livable world. The only positive lesson from the COVID-19 outbreak would be to change our perspective, values, and mentality. Let us transform for a different world and future.

The Perspectives of TTS: COVID-19 in Healthcare Workers

The Measures for the Protection of Healthcare Workers from COVID-19 Worldwide and the data on the Current Situation in Turkey

Healthcare workers (HCWs) have a higher risk of contracting COVID-19 compared to the general population in countries affected by the pandemic. The MoH declared the percentage of HCWs among all infected cases in Turkey as 6.3% [27, 28], similar to the 6% mean percentage of HCWs among infected cases worldwide [29]. Indeed, COVID-19 has been described as the first new occupational disease of the current decade [30]. Defining occupational characteristics of COVID-19 infection in HCWs not only allows for compensation but also enables taking appropriate measures for occupational health and safety. Governments of affected countries have decided those measures along with the measures to control the outbreak. Both national and international organizations, namely WHO, Centers for Disease Control and Prevention (CDC), and the European Centre for Disease Prevention and Control (ECDC) have published interim guidance and recommendation documents [31]. The MoH has also published documents for infection control measures for COVID-19 [32]. The recommendations of international organizations include organizational measures and measures targeting control of the host, route of transmission, and personal protection of HCWs. Starting from preparing an organizational plan, each organization needs to determine the sites for outpatient and inpatient clinics, waiting rooms, examination rooms, and sampling rooms and educate the HCWs on case definition, disease management protocols, and infection control measures. Both ECDC and WHO published their recommendations on these aspects [33, 34]. Despite the importance of these measures, most countries have been caught unprepared for the pandemic. Thus, the HCWs have faced COVID-19 in their natural settings. This fact has made personal measures, including hand hygiene and personal protective equipment (PPE), much more critical. The recommendations of WHO, CDC, and ECDC on the minimum level of PPE are similar except the usage of respirators, absolutely suggested when dealing with a patient with COVID-19 by ECDC [31, 34-36]. However, all recommendations include suggestions for respirator usage during aerosol-generating procedures. The respirators suggested for the protection should be at least N95 (according to US standards) or FFP2 (according to European standards) level [36]. Aerosol-generating procedures require additional measures to reduce the viral load, which HCWs may be exposed to. As one of the most frequent aerosol-generating procedures performed by the HCWs during the pandemic, nasopharyngeal sampling requires a minimal level of PPE including respirator, protective glasses or face cover, gloves, and gown. Some extra measures include the use of a closed cabin [35, 37].

After the announcement of the first diagnosed COVID-19 case on March 10, 2020, questions about HCW protection have been raised in Turkey. The initial number of 601 infected HCWs as of April 1, 2020, was updated on April 29, 2020, as 7,428 [27]. This rapid increase has gained the attention of professional associations and unions of HCWs. The Turkish Medical Association conducted an online survey repeatedly to monitor PPE access for HCWs [38]. As the leading association of specialists of Chest Diseases in Turkey, TTS also conducted a web-based survey prepared by its Occupational Lung Diseases Working Group [39]. According to our results, we observed the need for improvement in access of HCWs to gloves, respirators, surgical masks, protective glasses, face shields, and gowns at different levels of healthcare facilities. As of May 12, 2020, 35 HCWs, including 18 physicians, were

lost to COVID-19 in Turkey [40]. While we gratefully remember all the HCWs lost during the pandemic worldwide, we wish to emphasize the importance of preparedness of all governments in terms of protective measures at all levels.

COVID-19 in Healthcare Workers: Occupational Accident or Occupational Disease?

Considering the risks that healthcare professionals encounter in healthcare settings which directly contribute to exposure to SARS-CoV-2, many governments and organizations such as the International Social Security Organization (ISSA) have decided to evaluate COVID-19 within the context of occupational diseases of HCWs [41- 43]. COVID-19 is not yet included as an occupational disease in the current occupational diseases list of the government [44]. However, since it is obligatory to make notifications of infectious diseases suspected of being occupational diseases, we tried to discuss the evaluation and notification of COVID-19 in HCWs as an occupational disease, in accordance with scientific information and existing national legal regulations [45]. Although these legal regulations were not prepared directly for the evaluation and notification of occupational COVID-19, we thought that this information would be beneficial to physicians working in this field because they contain the principles of diagnosis and notification of occupational diseases. It should also be remembered that approval of COVID-19 as an occupational disease in HCWs is under the authority of the relevant boards of the Social Security Institution, including the Social Security Institution Supreme Health Board [45].

Protection of healthcare professionals from COVID-19 and infections in general is essential not only for their healthcare but also for the control of the transmission. Accordingly, finding the infected patient and taking preventive measures, and treatment and isolation of the patient constitute secondary prevention. Screening for infection should not be limited to symptomatic healthcare professionals, but also include those with the risk of infection. This is particularly relevant for COVID-19, the transmission of which has been reported during the asymptomatic period. Work related factors aiming for the continuity of work should not be an obstacle to the protection and management of healthcare professionals, and support should be provided for the care and requirements of the person under isolation. As recommended by WHO during pandemics, active surveillance includes visiting healthcare facilities and talking to healthcare providers and reviewing health records to identify suspected cases of infection. Cases, when found, are reported according to the national policy and epidemiological data collected, which would help in the mitigation of the infection [46].

During the current pandemic, various active surveillance programs have been carried out for healthcare professionals in different countries. These studies have made outstanding contributions to outbreak management. Legal structures and processes in different countries are different; however, examining the occupational dimensions of infectious diseases such as COVID-19 and keeping regular records and monitoring them provides valuable information for the healthcare systems for future pandemics. Moreover, notification of occupational diseases is essential for employees to obtain their rights that may arise from an occupational disease diagnosis.

TTS: Violence Toward Healthcare Professionals Should End

Violence against healthcare professionals (HCPs) is generally seen because of the unmet needs of the patient/patient's relatives [47]. The chair of the World Medical Association, Dr. Ardis Hoven, has warned governments about the possible increase in violence against medical doctors and institutions both in civil and conflict circumstances [48]. There was a concern that the violence against HCPs which had become almost commonplace before this outbreak, would go on in a different dimension during the outbreak; and unfortunately, the first embodiments are already evident. After the very first case of the outbreak, news about violence toward HCPs gained momentum. HCPs who work in the frontline are one of the most vulnerable groups for COVID-19. Along with not having proper PPE, anxiety and psychological disorders, long working hours, professional burnout, and stigmatization; psychological and physical violence increase the risk of COVID-19 [49-51]. In addition to the above, the increasing density of health work and urgent medical needs in the medical system due to the pandemic make the situation even harder.

TTS, with its mission to increase the respectability of medicine, and to improve the right and responsibility to intervene in the framing of health policies to the advantage of the public, is against health transforming strategies from the very beginning. TTS made the respect for patient rights and labor a principle and declared it in its by law, and considers this transform and performance system as a threat to the vision of creating an ideal working environment for doctors and qualitative service for patients. The performance system that makes health service paid, prioritizes quantity over quality, damages the team work and motivation of HCPs, and ruins the patient-physician relationship, disturbs the peace in the healthcare environment, and encourages violence against HCPs [49-51]. Therefore, this paper is aimed at discussing the additional suggestions and precautions over the previous demands of TTS asking for an urgent change of the performance paid system, for making the relations more democratic, and providing guaranteed work environments.

The Health Services Main Law, which came into existence with the votes of all the parties in the Turkish Grand National Assembly, is a great beginning, but it is important that this law be implemented [52]. The changes in law that included only HCPs are against the approach that healthcare is teamwork. Many workers who were subcontracted in cleaning or security roles were excluded. Delaying the declaration of sentence in the law will cause the sentence to not be a deterrent for third parties, who by giving up their right to take the judgment to a superior court, will be abandoning objection and smoothing the way for delaying the penalty. More importantly, the definition of "looking for intent" in the law should be changed to "without looking for intent" in all items so that it cannot be used against HCPs. It is critical that these proposals be implemented urgently, especially during this outbreak; and all elements that cause death, injury, burnout, or encourage suicide in HCPs should be resolved. Violence against HCPs is increasing in the general society, and HCPs are turning into vulnerable targets. This threatens their physical and psychological health, causes burnout syndromes, and ruins their future. Our demand is to have a safe and peaceful work

environment to enable us to do our work effectively. We once again would like to reiterate that legal regulations should be just, equitable, comprehensive, and should be applied without any compromises to enable a safe health environment.

TTS Perspectives: COVID-19 Pandemic and the Organization of Hospitals in Turkey

The hospitals affiliated with universities, the MoH, and the private sector have quickly organized themselves during the COVID-19 pandemic. The care providers have tried their best to determine the common and differing features of the response by collaborating with their colleagues working in various institutions. However, certain institution-specific issues may have remained unsolved. To deal with the pandemic as smoothly as possible, the following measures should be taken as : (1) HCWs need to feel safe and secure during the pandemic, (2) there needs to be an equal and fair sharing of the work load, (3) the work hours should not cause physical and mental fatigue, and 4) HCWs should be provided with a work environment where they will feel valued. In Turkey, although there were very well-organized hospitals equipped to handle the pandemic, some hospitals are not so. Standard practice, laws, and regulations for hospital organizations are not available during the pandemic in Turkey. Although the diagnosis and treatment guidelines prepared by the Science Committee of the MoH has reduced the workload of physicians who work in the field and this guideline has been a reference manual for managing the disease, a more detailed manual that includes how hospital organization and task distribution should be done during the pandemic is necessary. This post may be a reference to what is needed to be done in the future [53-55].

TTS Activities During the Pandemic

A New Gathering: Virtual Seminars and Digital Learning

Since the outbreak of the COVID-19 pandemic, TTS has arranged a specific program aiming to enhance the knowledge and training of its members in line with the principles and priorities written in its founding regulations. In this respect, a commission has been established to organize online plenary/ad hoc meetings, set the agenda, and resolve the practical issues during those meetings. The commission takes the final decision after deliberation by its members. The first webinar on "The organizational preparation for pandemics" was telecast on March 16, 2020. The effects of the pandemic on each of respiratory fields were elaborated upon, and informative documents were prepared regarding probable solutions. Following the webinars, the gathered knowledge was regularly shared by all members. For the purpose of meeting more frequently and remaining updated, a *Zoom* platform allowing simultaneous participation of 1,000 individuals with translation services was established. More than 15 plenary meetings were convened on this platform [56]. Using various media tools, such as an institutional *Whatsapp* line, official guidelines were widely announced to the members of the TTS to keep them informed in real-time. Not only within our own field, communication and knowledge sharing happened across fields. In this respect, we arranged meetings and concurred with professional associations/societies of other fields. We thus provided knowledge and expertise of respiratory diseases to various institutions in this critical period. Conscious of the vitality of human resource planning and the policy implications for the pandemic, we have organized conventions to streamline the process of human resource planning and formulate effective policies. In conclusion, even before the first reported case in Turkey, TTS has been instrumental in fulfilling the knowledge expansion and capacity of its members and has since been persevering in enhancing their education in line with its mission. TTS sees this unprecedented pandemic as an opportunity for learning and education and has formed a new educatory platform fully funded by its own budget and internal dynamics. This platform has been a catalyst in terms of training and capacity enhancement, rendering the members more independent and competent in their performance.

Using the Digital Environment for Information Sharing

Nowadays, our daily life is surrounded by digital devices. We are expected to learn to use these devices and conduct every process over IT based technologies. This became all the more critical and mandatory during the outbreak period between March and May 2020. While there has been an ongoing transformation in our IT systems, the process has suddenly accelerated because of the new requirements. The first activity was the press conference in our headquarters the day after the announcement of the pandemic. Later on, there have been many activities regarding updates, diagnosis and treatment guidelines by the MoH, information from our working groups and news about press conferences being released on our website. Valuable diagnosis and treatment guides, information about our study groups in different fields of work, and news that conveys our opinions are shared with our members and the community through social media and our website. In addition to our homepage for healthcare professionals, regular and frequent information, news and announcements are shared on our homepage for the public and our patients [57]. A 'Case Consultation' online platform was organized rapidly for our members working in the field and used actively. We dealt with COVID-19 in almost every aspect with frequent and fast participation webinars organized rapidly. A total of 15 webinars were held, and the recordings of these meetings were shared on our official YouTube/text copyright channel [58]. The rapidly increasing number of subscribers and the positive feedback have encouraged us tremendously. With all these activities taking place on our social media accounts and being shared more, our watch rate has increased considerably. We have put into practice informative and scientific activities for the society to activate the common mind with our activities. During this period, a large number of scientific articles are being published. Thus, we have prepared literature reviews and Q&A booklets and shared them with large audiences in collaboration with our work and task groups to provide access to these information sources, which increased rapidly because of the high workload of our members [59]. We continued using our mail group efficiently to be in constant touch with our members. In an environment of ambiguity, where information flow is fast and it is difficult to access correct information, TTS is considered as an important address, and we demonstrated our competence as an association in promoting as well as serving our principles of protecting lung health.

Handling the Scientific Sources and Needing National Data

The current COVID-19 pandemic revealed that an excessive amount of information could be produced in a short time, which could be both beneficial and harmful. The "primum non-nocere (first, do not harm)" approach that Hippocrates advised approximately 2,500 years ago is the motto of the art of medicine [60]. The best tools to fight against misinformation are the reliable data produced by healthcare researchers. Trustworthy and methodologically produced papers may require some time traditionally. Since there is a need for rapid information to fill the information gaps about COVID-19, some of these traditional delays have been circumvented during the current pandemic. It remains unclear how valid and trustworthy the data are from the enormous amount of publications about COVID-19 [61]. One of the major concerns of clinicians is to critically evaluate multiple research results and decide which ones will guide their clinical approach. Examples of dubious and scientifically questionable reports that have been corrected, and even retracted, after being published in highly reputable journals support our concerns [62]. WHO has a website that can be used as a resource for reliable information during the pandemic [63]. Similarly, there is an online center that provides free access to scientific publications about COVID-19 [64]. The Early Career Task Force Group evaluated scientific publications rigorously to avoid contributing to disinformation and summarized it for all the members of TTS [65-67].

Objectivity and a systematic approach as well as freedom and autonomy are essential characteristics of a scientist [68]. During the pandemic, countries worldwide, especially China and Italy, shared their experiences and data. Unfortunately, the data of our country did not contribute much to the literature. A preliminary assessment and approval by the MoH before the approval of the ethics committee have become mandatory for all research regarding COVID-19, and this obligation has led to inappropriate processes. Considering that COVID-19 is neither the first pandemic in history nor the last one unfortunately, our experience in accessing reliable information and collaborating with colleagues will be helpful for controlling the next pandemic.

The TTS Research Perspective: Clinical Trials During and After the COVID-19 Pandemic

The impact of the COVID-19 pandemic on clinical trials is inevitable worldwide. There is a potential to increase operational burdens on clinical research programs and limit participation in clinical trials and access to newer treatments for all patients [69-74]. Until March 2020, record data from nearly 4,600 current clinical trials and more than 182,000 workspaces worldwide was available. Significant decreases are seen in the number of new patients entering clinical trials during this pandemic [69]. In March 2020, there was an average 65% decrease in new patient registration worldwide compared to March of the previous year. This decrease in major markets ranges from 43% in Japan, 67% in the United States, 68% in China, and an 84% decrease in India [69]. Another negative result of COVID-19 pandemic on clinical research is that many of the clinical surveys in various therapeutic areas, which were planned to begin in the pre-pandemic period, have been suspended [70]. Similar problems are experienced in our country; however, there are no documented data that reflect the accurate situation in Turkey. IMS Health & Quintile (IQVIA), one of the global research organizations, reported that there was an average decrease of 85% between March and April 2020 in new patient registration in the clinical studies carried out in Turkey. In clinical trials, the effect of COVID-19 was seen differently in different therapeutic areas. Clinical trials in the respiratory area decreased by 34%, while similar reductions were observed in other therapeutic areas analyzed; 47% decrease in infectious diseases, 48% in oncology, 64% in dermatology, 68% in neurology, 70% in cardiovascular diseases, and 80% for studies in the field of endocrine diseases [69]. Major challenges and obstacles to conducting a clinical research during the COVID-19 pandemic can be summarized as [69-71]: (1) Limitations on patient visits due to mobility and travel clampdown. (2) Insufficiency of technological equipment and application of technology. (3) Supply chain and the logistics of medicines and laboratory materials.

Strategies for Conducting Clinical Research During the COVID-19 Pandemic

"European Medicines Agency (EMA)," "U.S. Food and Drug Administration (FDA)," and "The European Commission (EC)" have published some relevant reports/guidelines, particularly on issues such as safety and scientific difficulties. This may have an impact on clinical research, particularly in the management of clinical research during the pandemic. They have developed new policies and procedures [73-76]. Similarly, the Turkish Medicine and Medical Device Authority of the Turkish MoH (TITCK) has published a report on the measures to be taken in the management of clinical research in the COVID-19 period [77]. The main measures contained in these reports/guidelines and recommended for the management of clinical research in this process are summarized as: (1) Temporary stop or early termination of the trial. (2) Continuing the clinical trial with emergency safety preventions. (3) Protocol deviations. (4) Supply of products used in the research (5) Laboratory and imaging service changes. (6) Change of visits in the research center with possible postponement of some visits. Tele-visits should be encouraged, and the option of home visits should be evaluated. Despite all precautions, if treatment/follow-up is not possible, he or she should be removed from the research cohort. (7) Research center and research team changes. (8) Use of technological equipment. Approval of the ethics committee is needed for all these measures and deviations.

Future Opportunities to Develop Clinical Research After COVID-19

One of the first lessons learnt from the COVID-19 pandemic is that it is possible to conduct more fluid or pragmatic clinical trials. Future clinical trials are likely to be designed with more expanded and/or flexible timelines and data collection requirements without negative consequences. Adaptations in this direction will facilitate the execution of clinical research programs for both patients and researchers [71-74, 78]. Another lesson from the COVID-19 pandemic is the ability to routinely use technology to limit research center visits for patients in clinical trials [71-74, 78]. In conclusion, we can say that clinical trials are at a difficult juncture due to COVID-19.

The current environment underlines the need to identify, develop, and implement new approaches considering the risks and obstacles experienced in the execution of clinical trials in this period. It may be useful to develop official COVID-19 standard working procedures that include these steps in the execution of clinical trials, and these may be used again during other epidemics. In the current situation, TTS has supported the measures taken by TITCK.

The TTS' Perspective of the Management of COVID-19 Pandemic

Diagnosis, Treatment, and Follow-up of COVID-19 Cases

The COVID-19 outbreak, which appeared in China in late December 2019 and quickly spread around the world, leading to numerous deaths, was declared a pandemic by WHO on the 11th of March 2020 [9]. The first case and the first death in Turkey were reported on the 11th and 15th of March 2020, respectively, by the MoH [37]. The MoH has been organizing pandemic response activities all over the country since February. The MoH first organized an advisory board comprising several disciplines in January. The board organized guidelines for case definition and management quite early. That was a timely step for the doctors who work in the field. Several hospitals were announced as pandemic centers. Hospitals were equipped with PPEs; however, there was a shortage of N95 masks. PCR was available from the beginning of the pandemic. According to available data, the disease has a mild clinical picture in most patients (85%), while in some patients it leads to severe respiratory failure and death (5% of the total cases) [79]. There is serious uncertainty about the pathogenesis of the disease. While both WHO and the CDC accept the positivity of serological tests or detection of SARS-CoV-2 RNA by molecular methods for definitive diagnosis, while the MoH accepts PCR positivity for definitive diagnosis [37, 79-81]. However, the sensitivity of PCR seemed to be low; and therefore, many patients were diagnosed by radiology for an appropriate clinical picture and treated accordingly. The contacts of the positive test cases were monitored by the Provincial/District Health Directorates by telephone for 14 days after their last contact. There is currently no definite approved treatment for COVID-19. The recommended treatments and discharge criteria for patients to be followed in both outpatient and pandemic services are constantly being updated and published in the MoH guidelines [37]. Accordingly, we have administered mainly hydroxychloroquine based treatment in our country, and favipiravir and immune plasma are recommended for hospitalized patients; however, none of these drugs has proven effective by high quality studies. These treatment options have been available throughout the country from the early days of the pandemic. It appears that although Turkey is among the countries with the highest prevalence of the infection, the mortality rate is low among PCR positive patients. To compare national data with those of other countries, it is certain that multicenter studies are urgently needed.

Intensive Care in the COVID-19 Pandemic

At the very beginning of the COVID-19 pandemic, treatment was not known in China and acute lung injury, need for intensive care, intubation, and ventilation were often required with high mortality rates in patients with complications [82-85]. Sufficient oxygenation was not possible in patients who were intubated, and data on lung damage owing to intense cytokine release and widespread micro-thromboembolism were later reported in autopsies.

The Health Minister informed the nation of the first case infected with the coronavirus on March 9, 2020. There was a rapid increase in the number of cases in the next few days. However, in contrast to the European countries and the United States, Turkey did not experience a shortage of intensive care beds in this pandemic period because it was in better shape regarding intensive care beds with 45 beds per 100,000 population [86]. The number of ventilators also seemed sufficient, and timely modifications were made in the wards that could be transformed into intensive care facilities. It was declared that the occupancy rate in the intensive care units (ICUs) was 60% over a two-month period [87]. The importance of negative pressure ICU rooms was underlined in this pandemic. Unfortunately, very few centers have negative pressure ICU rooms. Again, in Turkey, most of the ICU beds are not separated by a preserved area and thus isolation rooms are limited in these circumstances. Appropriate planning should be done in this direction in the future.

For treatment modalities, the MoH has prepared and actively updated comprehensive guidelines, including intensive care recommendations in line with the literature [37], which are rigorously followed by HCPs. The use of noninvasive mechanical ventilation and high-flow oxygen therapy were discussed during the webinars. The production of aerosols and the possible transmission of viruses to the HCWs were also the main issues discussed.

COVID-19 in Specific Groups

Pediatric Cases: Course of the Pandemic in Children in Turkey

COVID-19 infection in children is often asymptomatic, and they have a milder course of disease than adults. Therefore, children and adolescents are major factors in the spread of the disease and the development of herd immunity. On this basis, it differs from other viral respiratory tract infection agents such as RSV, which can be fatal, especially in infancy. Literature data suggest that the transmission to pediatric patients is mostly through close contact and respiratory droplets from family members. Since children are mostly asymptomatic, they may be more infectious [88]. Symptoms such as fever and cough are not reported as frequently as in adults, and the infection is not as severe in children. Nevertheless, hospitalization may be required for some children because of serious illness [88-93]. In the literature, there are insufficient data on the course of COVID-19 disease in children with underlying serious diseases such as chronic pulmonary or cardiac disease, severe neurological deficits, and immunodeficiency.

Data of pediatric patients in our country have not been published yet. Like all adult cases, all pediatric cases are reported to the Turkish MoH, published in daily statistics, but data such as the ratio to all cases, age groups, mortality rates, comorbid diseases, intensive care/mechanical ventilator needs are unknown. The age and gender statistics were announced for the first and last time in a press conference held by the MoH

on April 7th; while the total number of cases were 34,109, the ratio of children under the age of 15 was shown to be below 5%. The ratio of children under 5 years in all cases was around 2%. Death under the age of 20 was rare. From our communication with the Pediatric Lung Diseases Assembly of the TTS, we know that pediatric cases are fewer than adult cases in our country, and also that the disease is milder in the pediatric age group. Only in patients with underlying neurologic, immunologic, or cardiologic diseases, the course was more severe, and there was a need for respiratory support. Furthermore, it was heartening to note that patients with cystic fibrosis, bronchiectasis, and asthma survived the disease with mild symptoms.

COVID-19 Pandemic and Lung Cancer

One of the patient groups adversely affected by the COVID-19 pandemic is that of cancer patients [94]. Cancer patients with COVID-19 have a higher risk than those without cancer, and higher intensive care hospitalization and mortality rates are observed in these patients [95]. Moreover, it has been reported that this is not associated with any specific treatment or comorbidity, and most deaths are caused by the SARS-CoV2 infection [96]. To prevent transmission, the treatment of cancer patients was delayed or changed, and they could not benefit from health services sufficiently during the pandemic. For these reasons, many associations have created guidelines for the management of patients with lung cancer. The first guideline from China provides key points and recommendations for the management of patients with advanced non-small cell lung cancer (NSCLC), strategies for the use of anti-tumor drugs, specific measures, drug reactions, and differential diagnosis of patients with COVID-19 pneumonia [97]. During the COVID-19 pandemic, it is recommended that RT-PCR test be performed on lung cancer patients before cancer treatment to ensure that SARS-Cov-2 is not transmitted. It is also stated that the start of postoperative adjuvant chemotherapy can be postponed according to the pathological diagnosis, clinical stage, risk factors, and prognostic factors. In patients with advanced lung cancer, chemotherapy can be delayed for a moderate period in the presence of a low tumor load and stable disease, or oral therapies can be arranged. If the patient needs IV chemotherapy, it is recommended to choose the closest experienced hospital that has no contact with COVID-19 patients [98].

In patients with lung cancer, fever and respiratory symptoms should be evaluated for other possible diagnoses in the differential diagnosis of COVID-19. Infections other than COVID-19 and pneumonitis due to radiotherapy or immunotherapy should be excluded, and other diagnoses such as tumor progression, pulmonary embolism, and pulmonary edema should be taken into consideration in the differential diagnosis [99].

During the pandemic, lung cancer screening programs, management strategies for lung nodules, and follow-up and treatment recommendations for early-stage tumor were presented. It has been suggested to postpone annual surveillance thoracic computed tomography for lung cancer screening. Regarding the evaluation of medium and high-risk lung nodules, a 3 to 6 month delay was considered acceptable. Surgical resection or stereotactic body radiation therapy has been recommended for nodules ≥8 mm with a high probability of malignancy [100]. Before surgery, clinical, radiological, and laboratory examinations should be done for COVID-19. It should also be kept in mind that negative PCR results may indicate a stage of infection in which PCR is not yet positive. If COVID-19 is suspected during or after the procedure, PCR sampling should be done for the patient, and the healthcare personnel should be isolated for at least 14 days and tested for PCR [101]. Patients who received chemotherapy in the last 3 months and received wide-area radiotherapy are expected to be at high risk for COVID-19. In the presence of suspicious symptoms, the possibility of COVID-19 should be considered, and these patients should be evaluated in the relevant departments before being brought to the oncology centers, and RT-PCR SARS-CoV-2 test should be performed [102].

Guidelines from ESMO (European Society for Medical Oncology), recommend classifying patients according to their treatment priorities. It is suggested that if the patient's condition is life threatening, clinically unstable, and/or the magnitude of benefit qualifies the intervention as high priority, the treatment can be continued; and if the patient's condition is stable enough that services can be delayed for the duration of the COVID-19 pandemic and/or the intervention is non-priority based on the magnitude of benefit, or low priority, postpone the treatment for an appropriate duration [103]. NCCN (National Comprehensive Cancer Network) has published a guideline for NSCLC that includes treatment recommendations in the fields of surgery, interventional radiological procedures, radiation oncology, and medical oncology with detailed information [104].

The COVID-19 pandemic has completely changed human life and approaches to lung cancer treatment. We recommend reconsidering the treatment decisions of patients according the diagnosis, stage of the disease, tumor burden, and the patient's clinical conditions. In order for lung cancer treatments to be sustainable, the first thing to do is to leave a sufficient number of "clean hospitals" in the country's health system without affecting the COVID-19 struggle. In addition, with adequate PPE, both patients and HCWs should be protected from possible contamination.

COVID-19 Pandemic and Obstructive Diseases: Asthma, Chronic Obstructive Pulmonary Disease and Obstructive Sleep Apnea

Asthma and COPD are common obstructive lung diseases, and patients with obstructive lung diseases have been expected to be severely affected during the COVID-19 pandemic. Patients with asthma are more sensitive to viral respiratory infections than healthy people, and viral infections can trigger severe attacks especially in patients with uncontrolled asthma. Asthma may also cause insufficient and delayed natural antiviral immune response [105]. In the early reports coming from China, asthma has not been reported as a risk factor for severe COVID-19 disease [106, 107]. Asthma prevalence in hospitalized patients in the United States was 17% [108]. The prevalence of asthma in COVID-19 disease is surprisingly low, and this can be explained by the relatively low smok-

ing rates in asthmatics [109], underdiagnosis of COVID-19 in patients with asthma owing to similar respiratory symptoms, and the effects of asthma medications on viral infections, where the use of inhaled corticosteroids (ICS) decreases asthma attacks. ICS can inhibit coronavirus replication and cytokine release [110]. Insufficient data about the effect of asthma on the severity of COVID-19 makes it controversial. However, patients with asthma should continue to use their current asthma medications, and it is important to emphasize that controller treatments including ICS should be continued during the pandemic. Allergic rhinitis patients also should use intranasal steroids and during attacks, systemic corticosteroids may be used. If indicated, biologic agents could be evaluated for the treatment of patients with severe asthma, and they can be administered under safe conditions in a hospital or at home [111].

In COPD, COVID-19 infection prevalence has been reported as 1.1%–2.9% in different series, initially from China, and later on from other countries [85, 112]. There are many contributing and facilitating factors for COVID-19 infection in patients with COPD, such as increased local and systemic inflammatory response, decreased immunity, instability of microbiome, persistent mucus production, structural damage in lungs, and use of systemic corticosteroids in acute exacerbations. In the meta-analysis of Lippi et al. [113], the odds ratio of severe COVID-19 disease revealed a 5-fold increase for patients with COPD. In another meta-analysis, including studies from December 2019 to March 2020, the risk of severe disease has been reported to have a 4-fold increase in patients with COPD [114]. In the United States, the data of 76,993 patients hospitalized for COVID-19 infection have been evaluated and the rate of COPD in this population was 0.95% [115]. In a meta-analysis of 6 studies including 324 patients with severe disease and 1,234 patients with mild or moderate COVID-19 infection, the risk of progression for patients with COPD has been shown to be increased 5.97 times, and the risk of ICU admission for patients with COPD has been shown to be increased 8.30 times [116]. From the beginning of this pandemic, patients with COPD and their relatives or caregivers have been warned about the increased risk of severe COVID-19 disease and the importance of the protective measures as well as the maintenance of their routine therapy for COPD.

In sleep apnea, obesity is a well-known risk factor, and 60% of moderate-to-severe OSA patients are obese. Obesity was also reported as a poor prognostic factor for COVID-19. Simmonet et al. [117] showed that in patients with COVID-19 treated in the ICU, body mass index (BMI) was a risk factor for mechanical ventilation with an 7.4-fold increased risk for patients with BMI>35 kg/m^2 compared to ones with BMI<25 kg/m^2. As OSA and COVID-19 share similar risk factors, it can be suggested that COVID-19 infection may result in severe disease, and OSA patients should be monitored closely [118]. In patients with moderate-to-severe OSA, the use of positive airway pressure (PAP) is very important, and the cessation of PAP therapy during the pandemic will negatively affect the physical and emotional health status of the patients [119]. NICE (National Institute for Health and Care Excellence) guideline for patients with OSA during COVID-19 pandemic suggests continuing the use of CPAP (Continuous positive airway pressure) treatment in patients without of SARS-CoV-2 infection [120]. However, WHO declared PAP treatment as an aerosol-generating procedure. If the infection status is unknown or asymptomatic, patients with OSA may be a risk for other members in the house [121]. In patients with sleep apnea hospitalized for COVID-19, NICE recommends not using the PAP machine due to aerosol production unless the doctor decides to start PAP treatment [120]. If necessary, CPAP or NIMV (Noninvasive mechanical ventilation) should be applied via an oronasal or full-face mask with ICU ventilators with a double circuit, and the use of viral/bacterial filters is required. If possible, the patients should stay in negative pressure rooms, or else a single room is mandatory [37, 121]. In patients infected with SARS-CoV-2 and isolated at home, stopping the PAP treatment for 14 days might be sensible [119].

In conclusion, TTS has made many contributions supporting colleagues, sharing scientific data with doctors and keeping them updated, and informing the public since the first case of COVID-19 in Turkey was reported. TTS has arranged online educational meetings to reach out to clinicians working in the field and has published digital material to increase public awareness via social media and website. Since TTS looks at health in all aspects including biomedical, social, environmental, and mental, it needs to intervene in the framing of public health policies. On the basis of its foundation principles and mission statement, TTS has stated the importance of scientific data and multi-dimensional perspective to adjust health policies and management plan of a pandemic. In this review, we have summarized the contributions of TTS toward the information dissemination about COVID-19 and its perspectives on many aspects of the pandemic.

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