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The Syndemic Theory, the COVID-19 Pandemic, and The Epidemics of Non-Communicable Diseases (NCDs)

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Abstract

Background: The syndemic theory is based on the interaction of two or more epidemics. This phenomenon is important in the current COVID-19 pandemic.

Results: This pandemic affects all aspects of human life, including the management of non-communicable diseases (NCDs) such as cancer, diabetes, hypertension, and so on. This effect may have an impact not only on the management of the underlying NCDs but also on the infection and prognosis of COVID-19. Another aspect of this syndemic is that the health policies in each country have been revolutionized as a result of this pandemic, and the association of COVID-19 with other NCDs necessitates the implementation of new policies to properly manage this syndemic.

Conclusion: In this paper, we review the syndemic theory, how the COVID-19 pandemic could be classified as a syndemic with other NCDs, and how this pandemic changes circumstances for policymakers in any country, particularly the Islamic Republic of Iran.

Keywords: Syndemic, COVID-19, Non-Communicable Diseases, Health Policies

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Introduction

The word syndemic, at its simplest level, implies two or more epidemics interacting synergistically and contributing, along with their interaction, the additional burden of disease in an area or population is greater than the sum of the two (1). In December 2019, the first case of the newly known virus referred to as SARS-COV2 (severe acute respiratory syndrome coronavirus 2) was reported in Wuhan, China. The virus was initially identified as a local epidemic but was gradually declared a pandemic by the World Health Organization as the disease spread worldwide (2). The COVID-19 disease (Coronavirus Disease 2019) has had an impact on many aspects of human existence, leading to the expansion of quarantine and the spread of pandemics over the world. Most epidemic disorders detected in human societies in the last century have been greatly influenced by this disease. As a result, this pandemic has the potential to change the game for people who suffer from non-communicable diseases (NCDs) (3). The SARS-CoV-2 epidemics overlap with endemic diseases [non-communicable disease (NCD), human immunodeficiency virus (HIV), hepatitis C, Tuberculosis (TB), malaria, schistosomiasis, dengue fever, and various neglected tropical diseases (NTD)] and with seasonal diseases (such as influenza and respiratory diseases), several cultural and social determinants (fear, stigmatization, racism, gender, economic inequalities, misinformation, risk

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↑What is "already known" in this topic:
The syndemic theory was proposed to explain the interaction of two or more epidemics. The interaction between the management of non-communicable diseases (NCDs) and COVID-19, as a syndemic theory, has revolutionized all healthcare systems in various countries.

→What this article adds:
This paper discussed syndemic theory, the COVID-19 pandemic, and NCDs, as well as their impact on healthcare systems and policies in different countries, particularly Iran.

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behaviors, food and nutrition insecurity, occupation, climate, exposure to different types of pollution, supply of health and social care services, health care seeking behavior and violence, burnout among healthcare professionals, provide of medication and addictive behaviors) and climate and atmosphere (4-8). Despite widespread acceptance that the SARS-CoV-2 pandemic has become a learning process, much remains to be uncovered as we face the "next epidemiologic wave," and one wonders if society's attitude to co-existing health crises will ever proceed to the amendment. The SARS-CoV-2 has explained the complicated dynamics between a unique, difficult pathological state, co-existing, chronic, and endemic ones and, therefore the capital of information, competencies, and practices of individuals all over the world and stressed its basic syndemic nature. As a result, during this and future epidemics and pandemics, a greater understanding of the syndemic theory of health conditions and diseases is envisaged (8).

COVID 19 pandemic and noncommunicable disease (NCD) epidemics; a syndemic theory

Syndemic theory translates the cumulative factors between various epidemics. The hypothesis of syndemics is an ideational method in population health sciences that have the potential to assist policymakers and program implementers in their efforts to expand the health of populations. As originally theorized, three concepts underlie the theory: disease concentration, disease interaction, and also the large-scale social forces that create them. As theorized, syndemics are a problematic, multilevel phenomenon.

What makes the idea most vital are predictions about how interactions between different epidemics magnify the disease burden. This can be compared to the individual burdens of each disease. Besides, the hypothesis authorizes predictions about how public health planners can (or cannot) effectively intervene to mitigate this burden (8). The widespread COVID-19 pandemic has arisen in 209,201,939cases in 213 countries and territories around the world and two global conveyances, with 4,390,467fatalities as of 19 August 2021. Since around August 18, 2021, 4,543,716,443 vaccine doses have been injected (9).

The pandemic will potentially even have a significant long-term effect on people with non-communicable diseases. While the stress on management of this communicable disease is of utmost implication, the long-term impact on NCDs is additionally of crucial importance (10) It could further endanger the sustainability of healthcare systems by deteriorating the circumstance of patients with chronic and incurable conditions (10). The relations of COVID-19 with the following biological and social aspects seem to expand the danger of complications, deteriorate health outcomes, and heighten the burden on healthcare professionals and health systems. In contrast, there is an international rush to report on COVID-19 by improving intensive care unit beds, installing ventilators, tightening lockdowns, and accepting other restriction criteria (11). The early reports of the case fatality rate of people with non-communicable diseases(NCDs) who were infected with SARS-COV2 suggested about 7% that appears to be higher than the normal population (12) but further estimated rates seem to be lessened according to accurate calculations of infected individuals(including asymptomatic or minimally symptomatic cases) (10). Since the first month of 2020, many governments have initiated restriction criteria with different strategies for implementing voluntary or endorsed quarantine laws (13). These isolation protocols that targeted mostly older people and/or people with chronic comorbidities which may endanger them by SARS-COV2 infection also have major short and long-term impacts on NCD management and progression from different Perspectives (10). Quarantine measures will lead to a decrease in the amount of physical activity in many people. This could be the consequence of the closure of gyms, pools, and exercise clubs in addition to limited access to outdoor space for walking or running. These alterations reduce the level of physical activity that may be more crucial for people with non-communicable diseases like obesity, hypertension, and diabetes (10, 14-17). Reduced social contact as a consequence of quarantine in the COVID-19 era leads to increased loneliness in older individuals and a rise in mental health disorders such as depression (18). These conditions may affect the management of their underlying comorbidities and endanger them more to SARS-COV2 mortality. These conditions also have been implicated negatively in the extent of health outcomes including heightened healthcare utilization and mortality besides malnutrition and vitamin D deficiency (10, 19, 20). During the COVID-19 era, healthcare systems globally but with more difficulties in low and middle-income countries (LMICs), postponed and scaled down some aspects of routine management of people with NCDs (21). These approaches have been done to avoid unnecessary hospital visits especially for high-risk patients but also lead to poor control or mismanagement of their underlying diseases in some cases (10). People living with non-communicable diseases (PLWNCDs) should be motivated to monitor their disease precisely, follow their symptoms, practice self-care, adhere to medication, search for healthcare services accordingly such as counseling, practice physical distancing, wash their hands with soap and wear masks. Another important step during this syndemic is empowering self-management behavior modifications for NCDs and COVID-19 through SMS or social media platforms (11). The COVID-19 pandemic has intensified into a syndemic theory according to several crucial factors like overcrowding, loneliness, poor nutrition, and inadequacy of access to health services and medications; consequently, depression, suicide, domestic violence, and psychiatric illnesses(especially in elder individuals) have considerably risen (11, 22). Some other social determinants of health implicate extremely the intensity of the syndemic that, including: poverty, social inequality, social stigma, and the environment where people live and work (11, 23). According to previous research even after this pandemic and after that NCDs and related risk factors will remain the main challenge for human beings in the future. Whereas the recent pandemic will be a fundamen-

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tal militant transition for prioritization and resource designated in many countries in the following years, it is still obvious by evidence that NCDs will remain the fundamental cause of death and is the most expensive boundary to endurable nations (24, 25). Vaccination protocols have been prioritized in many countries for those over 60 years old who have chronic noncommunicable diseases (NCDs) such as hypertension or diabetes Mellitus (26, 27). Vaccinations in people with NCDs unspecified to their age have been provided as vaccination proceeds (28) Guidelines for people with chronic diseases and under treatment with various drugs have been provided in Iran, as in other countries, following the country's vaccination protocols (26, 27, 29, 30). It is preferable to be aware of NCDs especially during this pandemic due to the syndemic effect of these catastrophes on each other. Government should notice the syndemic theory cautiously and manage noncommunicable diseases as well as communicable ones by allocating enough resources and vaccination protocols for these high-risk patients against COVID-19 and helping them control their underlying comorbidities properly. The syndemic theory and the relationship between the COVID-19 pandemic and other health concerns, primarily non-communicable diseases (NCDs), are depicted in detail (Fig. 1).

Health policy in the pandemic era

During the COVID-19 pandemic, all health policy management and disease guidelines were reevaluated (31, 32). This global reconsideration of various diseases may be distinctive; for example, cancer patients' chemotherapy protocols, changes in the frequency of chemotherapy sessions, postponement of physician appointments, and COVID 19 vaccine considerations have been modified since the early notice of the pandemic until now (33-36). Other NCD management protocols, such as diabetes and CVD (Cardiovascular disease), have also been altered. People with diabetes were evaluated using telemedicine, and insulin therapy during COVID-19 infections was studied in several articles and trials, and the recent guidelines were updated consequently (37, 38). At the beginning of the pandemic in Iran, as in other countries around the world, Large amounts of ICU (Intensive Care Units) beds were dedicated to critically ill COVID-19 patients (9, 39), but as the pandemic progressed, some ICU beds were assigned to other patients, such as stroke patients. As a result, the allocation of beds was determined (40, 41). Another issue to consider is the decrease in the admission of patients with AMI (acute myocardial infarction) during this pandemic, although the mortality rate of AMI has not decreased. According to new French research, there was a 24% decrease in STEMI (ST-elevation myocardial infarction) admissions, similar baseline characteristics, similar use of reperfusion therapy, and numerically higher but not statistically different in-hospital mortality (42). Similar findings have been reported in Iran's health record system. As previously stated, telemedicine is playing an important role in the management of most NCDs such as diabetes, obesity, and hypertension during this pandemic (43, 44). In Iran, the health administration department has developed phone interviews and advisory systems to assist patients with comorbid disease and modification during COVID-19 infections. These principles for this follow-up system include: During the COVID-19 pandemic, training standards for nurses working in in-home care facilities for the treatment and education of patients with NCDs and their family members were developed. In addition to mental health care services for the general population, a grief psycho-social treatment method for COVID-19 survivors

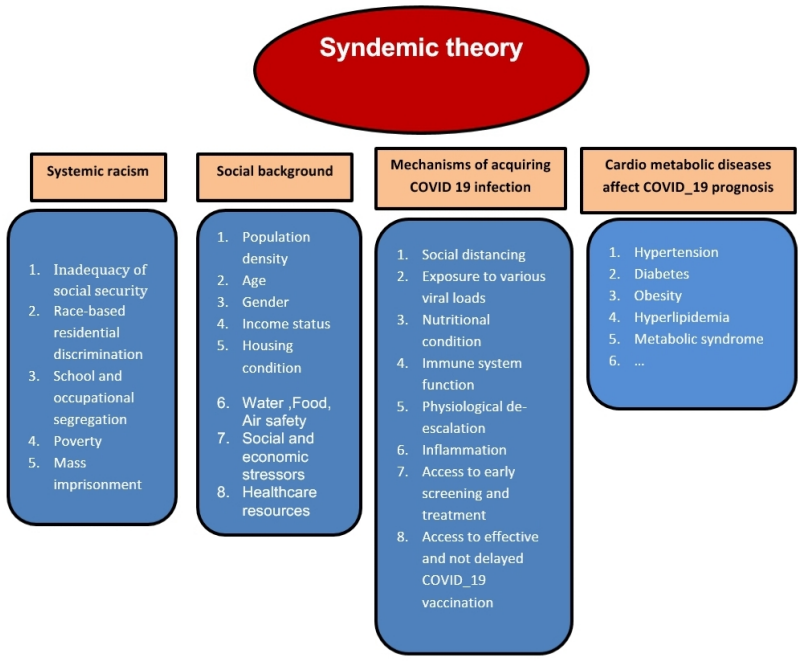

Fig. 1. Systemic racism, Social background, cardio metabolic diseases, and PATHWAYS to COVID-19 Infection: a possible syndemic framework

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was provided. In response to the COVID-19 pandemic, an identification program for the diagnosis, treatment and management of asthma has been implemented. During the COVID-19 pandemic, there are special guidelines for the management of patients with hypertension, diabetes, cardiovascular disease, and cancer. During this pandemic, recommendations including how to perform genetic screening and preventive services and testing been provided. Adults and children in Pandemic of COVID-19 can benefit from a home-based physical activity training program. Online nutrition advice over the telephone network had been provided. A Ministry of Interior pamphlet on the closure of hookah supply points and the collecting of hookahs had been delivered. Following a decision from the Ministry of Interior, we started mailing contact with health representatives from medical universities in Iran to coordinate with provinces.This phone system has been useful for providing mental support to COVID-19-infected patients and their families, managing NCDs, and providing diet advice to morbidly obese patients (32). Since the early announcement of the COVID-19 pandemic, the number of doctor's appointments has decreased, and some studies indicate that people are avoiding medical care units because they are afraid to come into encounter with the COVID-19 infection (45). This decrease in appointments has resulted in the mismanagement of some NCDs such as diabetes and hypertension and STEMI, as well as a decrease in the early detection of these health conditions (25, 42, 45, 46). In patients with noncommunicable diseases (NCDs), the health policy should be considered in COVID-19 vaccination. This includes the appropriate type of vaccines, caution in their drug modifications, and evaluation before and after their COVID-19 vaccination (28, 47, 48). As a highly infected country with COVID-19 (49), Iran's NCD guidelines and health care policies have been re-evaluated, and this pandemic introduces new challenges to Iran's health system. Critical notoriety and regional research should be provided to assist policymakers in submitting adequate health care for NCD patients as well as COVID-19 patients (50).

Conclusion

The syndemic model shares the ecological hypotheses of disciplines with a long history of health research and intervention. This assumption promotes the importance of bridging the gap between individual behavior and social determinants, as well as social and natural elements, and connects the syndemic model theory with One Wellbeing (8). Non-communicable diseases (NCDs) are a major public health concern that affects the current pandemic and could be influenced by it in a variety of ways, including management of underlying disorders, access to the healthcare system, and drug provision (10). As a result, the management of NCDs should be taken into account in this pandemic, and governments should commit more resources to help this matter properly. Vaccination protocols should be appropriately established and evidence-based so that high-risk patients with NCDs can be vaccinated immediately and effectively. This report interprets the syndemic theory between NCDs and the COVID-19 pandemic, as well as the new health policies and management plans implemented during the pandemic. This information may be useful to policymakers in Iran and other countries affected by the COVID-19 pandemic and NCD epidemic.

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Statement of Sole Submission

The author(s) guarantee that once their material has been accepted for publication by the MJIRI, they will not submit the same material or portions thereof to another journal before publication in MJIRI.

Conflict of Interests

The authors declare that they have no competing interests.

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