

## REVIEW ΑΝΑΣΚΟΠΗΣΗ

# The influences in the relationship between social determinants of health and COVID-19

Social determinants of health are the conditions shaping health, under which people are born, grow up, live, work and age. The information and awareness of the research on social determinants of health is based on the fact that medical care alone cannot adequately improve overall health, or reduce inequalities without considering where and how people live. Most of the factors that affect health are related to personal behaviors and lifestyle. The way people take care of their health affects their well-being and quality of life. The COVID-19 pandemic has received intense attention and requires vigilance, both nationally and globally, because of the high mortality and significant burden on the health system. The coronavirus disease (COVID-19) caused by severe acute respiratory syndrome (SARS-CoV-2) has spread widely, affecting most countries with increasing morbidity and mortality. As a consequence, human society has led to a catastrophic threat to public health, the global economy and daily lives of individuals. This review examines the relationship between social determinants of health (SDoH) and the COVID-19 pandemic and the ways in which people's lifestyle is affected. In addition, it highlights key information, supporting the government's role in emergency decision-making and management strategies, both nationally and internationally. The main goal is to formulate dynamic approaches, both for the prevention of health conditions in people living in the community, as well as to draw attention to findings and to suggest directions for research on this issue.

## 1. INTRODUCTION

Social determinants can affect health directly or indirectly by shaping people's behavior. It is estimated that the health of an individual or a population is affected by behavior for 40% to 50%, by the socio-economic environment for 20% to 30% and by health services for 10% to 20%.<sup>1</sup> The COVID-19 pandemic has aroused national and global interest as it is associated with significant impacts and increased mortality.<sup>2</sup> In late 2019, the Chinese city of Wuhan became the epicenter of a pneumonia epidemic due to a new coronavirus, SARS-CoV-2, called COVID-19. On March 11, 2020, the World Health Organization (WHO) officially declared the new coronavirus (COVID-19) a global pandemic.<sup>3</sup> COVID-19 is a virus of the coronavirus family that can cause serious health problems, especially in the elderly or even those with weakened immune systems or

chronic diseases. The ongoing COVID-19 pandemic is a threat to public health that is rarely experienced worldwide. Nearly 50 million cases and more than one million deaths have already occurred worldwide.<sup>4</sup>

According to another study,<sup>5</sup> more than 900,000 people hospitalized due to COVID-19 in the United States (US) since November 2020, almost two-thirds (63.5%) were attributed to four conditions: (a) obesity 274,322 (30.2%), (b) hypertension 237,738 (26.2%), (c) diabetes 185,678 (20.5%) and (d) heart failure 106,139 (11.7%). In other words, these hospitalizations might not have occurred if these underlying conditions did not co-exist. This underscores the importance of maintaining health-promoting behaviors, even when the constraints begin to ease, especially if there is an underlying medical condition. The virus infection (SARS-CoV-2), as well as the effects that the coronavirus can cause on a person,

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Η σχέση αλληλεπίδρασης μεταξύ  
των κοινωνικών καθοριστικών  
παραγόντων υγείας  
και της COVID-19

Περίληψη στο τέλος του άρθρου

### Key words

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are determined by age, gender, race, but also lifestyle in combination with one's medical history.<sup>6</sup>

Although the COVID-19 pandemic has aroused interest in health on an individual and community level, as well as a growing awareness of the need for better support towards vulnerable populations, it is evident that social inequalities related to health affect profoundly and unequally the rates of morbidity and mortality in the population caused by COVID-19. Many social determinants of health, such as poverty and lifestyle (e.g. homelessness, exposure to tobacco, alcohol use, diet, unemployment, level of education, environment), can have a significant impact on COVID-19 outcomes.<sup>7</sup> In addition, the psychosocial effects of the COVID-19 pandemic are equally significant. Individuals and their families with confirmed or suspected COVID-19 cases encounter fear, anxiety, anger, and post-traumatic stress disorder as a consequence of their experiences, while symptoms may persist afterwards (long COVID or post-COVID syndrome).<sup>2</sup>

## 2. SOCIAL DETERMINANTS OF HEALTH

The WHO has defined the Social Determinants of Health (SDoH) as "the conditions under which people are born, grow up, live, work and age", as they are fundamental factors that affect a wide range of indicators of human health, function and quality of life. These sets of forces shape the conditions of daily life and are responsible for inequalities, as well as the unjust and inevitable differences in the state of health of people observed in the UK. Globally, health inequalities represent the leading cause, discomfort and anxiety that can be avoided in lives that are lost prematurely.<sup>8</sup>

Over the last two decades, the public health community has increasingly addressed the SDoH which, in addition to medical care, can be influenced by social policies and stances.<sup>9</sup>

The term "social determinants of health" includes characteristics (e.g. the possibility of accessing hiking, recreation, healthy eating, etc.), which can influence health-related behaviors. Other socioeconomic factors, such as income, wealth, and education, are fundamental causes of a wide range of health outcomes.<sup>9</sup> Therefore, it is important that the agenda includes research priorities that will evaluate the interventions and the impact of policy and practice on the paths of social determinants of health. This priority is not a simple task, as the social determinants of health are complex. Many diseases and causes lead to many different intervention environments, in the context

of political, cultural and socio-economic diversity.<sup>10</sup>

In 2012, the United Nations member states adopted the "Rio political declaration" on SDoH, a commitment to strive towards a socially decisive approach to reducing health disparities within and between countries. The statement targets action plans, while recognizing the importance of socio-economic and political factors.<sup>11</sup> Inequalities in health are not only shaped by the unequal distribution of resources, but can include social isolation and a sense of control over one's circumstances and life choices. People need to feel that they have a certain level of control over their lives, jobs, housing and the environment, as well as other resources that improve the quality of life, as these can have a significant impact on the health outcomes of the population.<sup>12</sup>

In particular, action to reduce health inequalities is a priority in the United Nations Sustainable Development Goals adopted by 193 nations in 2015 and in many national health strategies initiatives present promising opportunities for further integration and focus on social determinants of health inequalities, with research capacity building activities, as behavior change is still a primary goal of action.<sup>13</sup>

More reports on health research have focused on three workflows: (a) Understanding the causes of inequality, (b) assessing the impact of national equality policy, and (c) developing and evaluating lifestyles and behaviors in improving health.

However, there is a lack of research on the effectiveness and interventions to reduce health inequalities that can be developed and implemented locally.<sup>14,15</sup>

Factors that affect health can be classified into four broad categories: Wider socio-economic and environmental factors, factors of the immediate environment (work, residence, food, etc.), factors related to behavior (lifestyle), and individual biological factors such as age, sex, heredity, etc., according to the model of Dahlgren and Whitehead<sup>16</sup> which maps the relationship between the individual, the environment and one's health.

In addition, healthy people<sup>17</sup> has grouped the SDoH into five main areas, which refer to economic stability, access to and quality of education, access to and quality of health care, the neighborhood and structured environment, and the social and community context, with the aim of creating social and natural environments that promote good health for all. In addition, it is important to note that the American Medical Informatics Association (AMIA) argues that access to broadband internet service should be added

to the list of social determinants of health.<sup>18</sup> These factors are not usually direct causes of the disease, but have been described as precursors to the causes of the disease.

### 3. COVID-19 AND THE RELATIONSHIP OF INTERACTION WITH SOCIAL DETERMINANTS OF HEALTH

Social determinants play an important role in influencing life expectancy and general health. In total, 20,507,518 years of life have been lost to COVID-19 among the 81 countries studied, due to 1,279,866 deaths from the disease.<sup>19</sup> The decline in life expectancy may continue due to the ongoing mortality from COVID-19 and the long-term effects of the pandemic on health, society and the economy.<sup>20</sup> To improve the public health impact of COVID-19, SDoH should not be underestimated.<sup>7</sup>

The COVID-19 pandemic health crisis has turned into a global financial crisis, endangering the health, jobs and incomes of millions of people around the world. The strict restraint measures adopted by many countries to reduce SARS-CoV-2 infection have effectively put a brake on most of the economic and social activities of individuals. Signs of continued economic slowdown will significantly increase unemployment and worsen the quality of life of individuals.<sup>21</sup> A recent study reports that lower-income populations are more likely to have chronic diseases and this puts them at a higher risk of COVID-19-related mortality.<sup>22</sup> Prolonged unemployment will also increase the risk of premature death and the rates of hospitalization.<sup>21</sup> In another study,<sup>23</sup> it was reported that in the USA alone, there will be 30,231 unemployment-related deaths jointed to COVID-19. Deaths were also high among black people and people with a low educational level. Several factors are associated with adverse health outcomes among disadvantaged and minority populations with lower levels of education, lower socioeconomic status, inadequate housing, insecure living and exposure to environmental hazards.<sup>24</sup>

It is also important to note that the COVID-19 pandemic raises serious concerns in the global education system as well. The adoption of measures to reduce the incidence of COVID-19, such as the isolation of individuals and the closure of educational institutions has created the method of distance education and teleworking with serious implications for the socialization of individuals, especially young people.<sup>25</sup> An interesting question that needs to be explored through further research is whether the COVID-19 pandemic will perpetuate the increased use of the internet (e.g. online learning, seminars, meetings), and whether this trend is socially and psychologically

desirable. Another study<sup>26</sup> showed that there were severe learning disabilities, increased student debt, and reduced access to educational infrastructure and research facilities. Students faced problems such as poor internet connection and inadequate digital skills. Unequal access to technology is another serious concern for many countries, especially the less developed, as well as for individuals with disabilities.<sup>26</sup> A United Nations report states that according to the International Telecommunications Union (ITU), approximately 3.6 billion people remain digitally illiterate, the majority of them in the least developed countries.<sup>27</sup>

In addition, another social determinant of environmental health (where people live) can have a significant impact on COVID-19 outcomes. Homeless families are at greater risk of transmitting viruses due to living conditions and reduced access to health care.<sup>28</sup> In addition, the COVID-19 pandemic is linked to other environmental factors such as air quality and air pollution, which may contribute to the spread and severity of COVID-19 disease. Air pollution may be associated with increased severity and mortality due to its impact on chronic diseases such as asthma, chronic obstructive pulmonary disease (COPD), cardiopulmonary disease and diabetes.<sup>29</sup> In addition, air pollution can increase the risk of infection by acting as a carrier of COVID-19.<sup>30</sup> As the creation of direct research cases hypothesises between air pollution, air quality and the COVID-19 pandemic, other factors such as local population density, age, gender, diet and socioeconomic status of individuals should be considered. Furthermore, in a 2019 Eurobarometer survey conducted in all EU member states, a high 58% reported that air quality had deteriorated in the last decade, with 28% believing that it had remained the same while only 10% answered that it had improved.<sup>31</sup> It is also important to mention that another research<sup>32</sup> reports that coronavirus SARS-CoV-2 spreads indoors with low humidity. Airborne transmission of SARS-CoV-2 coronavirus via aerosol particles indoors seems to be strongly affected by low humidity. Therefore, they suggest controlling the indoor air flow in addition to the usual measures such as social distancing and protective masks as well as their application in crowded rooms such as hospitals and other places.

In addition, a working group of the World Meteorological Organization (WMO) on 18.3.2021 issued its first report on meteorological factors and air quality factors affecting the COVID-19 pandemic. The aforementioned report warns that weather and climatic conditions, such as high temperatures in the northern hemisphere as a result of climate change, should not be used as an alibi for easing measures to stop the spread of the virus.<sup>33</sup> Climate change negatively affects social and environmental health determinants, such as air quality, safe drinking water and safe housing.<sup>34</sup>

It is noteworthy that the interaction of the COVID-19 pandemic with social, economic, environmental determinants seems to increase the risk of complications, worsen health outcomes, and intensify the burden on health professionals and health systems. On the one hand, the global COVID-19 pandemic response initiative has led to an increase in intensive care unit beds due to overcrowding in healthcare systems, and on the other hand, the epidemic has had an indirect impact on healthcare systems due to the delay of care in patients with chronic diseases.<sup>35,36</sup> Pre-existing chronic diseases, which are associated with social determinants, not only exacerbate the risk of COVID-19 infection but also exacerbate inequalities in chronic diseases. Due to the fear that many patients with chronic diseases become infected with COVID-19, they avoid seeking health care in both primary and secondary care, as well as in emergency departments in hospitals that treat patients with strokes and heart attacks, etc.<sup>37</sup>

According to a report of the European Union (EU),<sup>38</sup> 64% of the 159 countries surveyed had reduced the number of patients due to the canceled treatment they needed. The fact that resources are being diverted to control the COVID-19 pandemic is likely to disproportionately affect groups of people who are already at higher risk or in need of access to health care. Patients with chronic conditions are particularly affected by these disorders, which lead to an increased risk of mortality. Some people living with chronic illnesses no longer receive adequate treatment or may not have access to medication during the COVID-19 pandemic. There is a need to redesign all health care services in terms of staffing requirements from health professionals as well as from a financial point of view.<sup>38</sup>

Therefore, the COVID-19 pandemic has changed the severity of many health determinants,<sup>39</sup> even the lifestyle of individuals, radically changing their behaviors.<sup>40</sup>

#### 4. DISCUSSION

In recent decades, lifestyle has been recognized as a major determinant of health status and has become the focus of growing research interest worldwide. In terms of prevention, a healthy lifestyle is of vital importance.<sup>41</sup> Lifestyle can be classified according to people's lifestyle patterns and can be defined as a complex concept that involves an individual's consciousness regarding life.<sup>42</sup> Research linking COVID-19 to lifestyle has shown that a person's lifestyle is a critical factor in preventing infectious diseases.<sup>43</sup> However, most research has been conducted on lifestyle changes for certain age groups and the number of

lifestyle related studies for all age groups is insufficient.<sup>44,45</sup>

The COVID-19 pandemic period with global government measures which were applied in order to limit the spread of the virus by restricting the movement of people, social distance, disrupted routine, made it even more difficult for individuals and families to maintain a healthy lifestyle (healthy eating, physical activity, non-smoking, alcohol), and have a better quality of life as well as well-being.<sup>46</sup> Data from a national Blue Cross Blue Shield's survey<sup>47</sup> in the US show that some negative behaviors have increased since the onset of the COVID-19 pandemic. These behaviors can lead to anxiety, depression, and disorders from increased use of tobacco, substances, and alcohol. Specifically, the research showed a 23% increase in alcohol consumption, 19% in tobacco use and 13% in off-drug use. The research also reported the increased use of telemedicine since the onset of the COVID-19 pandemic among the 18–23 age group at 35%, 24–39 at 30%, 40–54 at 21% and 55–75 at 15%.

According to WHO statistics, 60% of deaths in developing countries are due to unhealthy lifestyles, and by 2030, 75% of global mortality is expected.<sup>48</sup> Other research<sup>49</sup> reported several psychological effects, such as depression and anxiety. These emotional disorders could lead to overconsumption of foods that tend to be high in salt, fat and sugar. Such behaviors, in combination with reducing physical activity (gyms which are closed, working from home) and increasing sedentary time (internet, television), can worsen obesity.<sup>50,51</sup> Nutrition plays a key role in health, prevention, management and treatment of a number of chronic conditions such as cardiovascular disease, diabetes, cancer and obesity, conditions that may be associated with mortality and increased risk of COVID-19.<sup>52</sup> According to another study,<sup>53</sup> in populations with a high prevalence of obesity, the COVID-19 pandemic affects younger populations more. In addition, the pandemic, combined with the economic downturn, is likely to severely reduce people's purchasing power, affecting food accessibility, which could easily affect overall food quality.<sup>54</sup> As a result, income is an important factor in understanding how consumers respond to the COVID-19 health crisis and how it affects food demand for consumers.<sup>55</sup>

In addition, smoking is associated with serious complications and high mortality of COVID-19 which underscores the great value of smoking cessation, especially as the COVID-19 pandemic may still persist.<sup>56,57</sup> Smoking is a possible way of transmission of the virus for both active and passive smokers.<sup>58</sup> A systematic review found that current or former smokers were more likely to experience severe COVID-19 symptoms than non-smokers, as well as an increased risk

of being admitted to an intensive care unit.<sup>59</sup> Smoking is the leading cause of death worldwide and it is estimated between 2005 and 2030, that more than 175 million people worldwide will die from smoking. Most smokers who try to quit smoking on their own are only 3% to 5% successful, while only 8% of health professionals have been trained in regard to quitting smoking.<sup>60</sup>

However, lifestyle changes brought about by the pandemic, such as lack of human communication as well as financial insecurity (uncertainty, unemployment), can increase the incidence of psychosocial disorders, leading to alcohol abuse.<sup>61</sup> As a result, increased alcohol use further exacerbates problems by forming bad behaviors such as domestic violence. It is reported that there has been a 60% increase in emergency services calls in the member states of the EU and a fivefold increase in hotlines for violence prevention.<sup>62</sup> Another study<sup>63</sup> reported that online alcohol sales increased more than two times compared to the year before the pandemic, up to 234%. As part of its public health response to COVID-19, the WHO<sup>64</sup> issued a report stating that alcohol consumption does not protect them from COVID-19, encouraging governments to impose measures to limit alcohol consumption. Alcohol consumption is associated with a number of non-communicable diseases and mental health disorders, which can make a person more vulnerable to COVID-19.

Despite the economic and social difficulties created by the pandemic, new trends are emerging in people's behavior. Thus, health crisis and financial instability affect individuals psychologically and financially, experiencing a transformation in their behavior and lifestyle.<sup>65</sup> Consumer patterns are rapidly shifting to online markets. However, many consumers have resisted online grocery shopping because they like to control the quality and freshness of meat and vegetables and this cannot be done online.<sup>66</sup> In fact, the COVID-19 crisis has accelerated the transition to digital services and digitization has become a basic necessity.<sup>67</sup> To combat the COVID-19 crisis, digital technologies play an important role in sustaining daily life and economic and social activities. Therefore, the coronavirus pandemic could become a critical point for the digitization of many services by accelerating the maturation of digital technology.<sup>67</sup>

## 5. CONCLUSIONS

Addressing social determinants is essential to reducing health inequalities, especially in developing countries with stretched health systems. The outbreak of the COVID-19

pandemic, which exacerbates morbidity and mortality, has put social determinants (SDoH) at the forefront as a key element in improving the health of the population in developing countries. Developing countries must therefore utilize key social determinants to prevent congestion or decongest their already fragile health systems and reduce the potential negative effects of the COVID-19 pandemic on their countries.

It is noteworthy that the COVID-19 pandemic absorbs the majority of the medical resources, resulting in delayed medical care for patients with chronic diseases. In response, telemedicine plays an important role. Medical services could be offered online, over the phone or via e-mail. Also, the upper limit of the prescribing period could be increased, in combination with an online follow-up consultation. As a general observation, the threat of pandemic is combined with measures of social distancing and has transformed the way of life into an ongoing process of digitization emphasizing the importance of digital innovation. However, there are many questions that need to be answered through the research agenda, regarding the digital divide in relation to demographic characteristics and socio-economic factors and especially education and age. Health education is a key to improving individual and population awareness of healthy lifestyle choices (e.g. lifestyle modifications such as diet, physical activity, tobacco and alcohol use). The formulation of policies that positively affect social and economic conditions as well as those that support changes in individual behavior and lifestyle can improve the health of the population and their quality of life. For example, in areas such as work, education contributes significantly to the improvement of working and living conditions, as well as to the quality of human relationships.

In addition, public health authorities and other people who are interested in public health can also support a larger number of green spaces and parks that can help reduce air pollution and improve air quality, while also promoting greater physical activity more active lifestyle and other benefits such as noise reduction. Doctors and other health professionals can encourage people to change their behavior and daily lifestyle to become more physically active through exercise and reduced use of motor vehicles. The monitoring of the numerous effects of COVID-19 is vital to improving the epidemic response in the future, whether it targets future COVID-19 waves or other unknown pathogens. To avoid the same catastrophic and different effects, long-term and sustainable change must be addressed across the spectrum of needs for health, society and the economy.

## ΠΕΡΙΛΗΨΗ

### Η σχέση αλληλεπίδρασης μεταξύ των κοινωνικών καθοριστικών παραγόντων υγείας και της COVID-19

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Οι κοινωνικοί καθοριστικοί παράγοντες της υγείας είναι οι συνθήκες κάτω από τις οποίες οι άνθρωποι γεννώνται, μεγαλώνουν, ζουν, εργάζονται και γηράσκουν διαμορφώνοντας την υγεία. Η ενημέρωση και η ευαισθητοποίηση της μελέτης για τους κοινωνικούς καθοριστικούς παράγοντες της υγείας έγκειται στο γεγονός ότι η ιατρική περίθαλψη από μόνη της δεν είναι ικανή να βελτιώσει επαρκώς την υγεία συνολικά ή να μειώσει τις ανισότητες, χωρίς να εξετάσει το πού και το πώς ζουν οι άνθρωποι. Οι περισσότεροι παράγοντες που επηρεάζουν την υγεία αφορούν στις προσωπικές συμπεριφορές και στον τρόπο ζωής. Ο τρόπος με τον οποίο οι άνθρωποι φροντίζουν την υγεία τους επηρεάζει την ευημερία και την ποιότητα ζωής τους. Η πανδημία της COVID-19 έχει ελκύσει έντονη προσοχή και απαιτείται επαγρύπνηση τόσο σε εθνικό όσο και σε παγκόσμιο επίπεδο λόγω της υψηλής θνητότητάς της και της σημαντικής επιβάρυνσης στο σύστημα υγείας. Η νόσος COVID-19, η οποία προκαλείται από τον ιό SARS-CoV-2, έχει εξαπλωθεί ευρέως, πλήττοντας πολλές χώρες με αυξανόμενη νοσηρότητα και θνητότητα, με αποτέλεσμα να συνηθιστεί για την ανθρώπινη κοινωνία μια καταστροφική απειλή όσον αφορά στη δημόσια υγεία, στην παγκόσμια οικονομία και στον καθημερινό τρόπο ζωής των ατόμων. Η παρούσα ανασκοπική μελέτη διερευνά τη σχέση των κοινωνικών καθοριστικών παραγόντων της υγείας (SDoH) με την πανδημία COVID-19 και το πώς επηρεάζεται ο τρόπος ζωής των ατόμων. Επιπρόσθετα, αναδεικνύει βασικές πληροφορίες, υποστηρίζοντας τον κυβερνητικό ρόλο λήψης αποφάσεων και στρατηγικών διαχείρισης καταστάσεων έκτακτης ανάγκης, τόσο σε εθνικό όσο και σε διεθνές επίπεδο. Κύριος στόχος είναι η διαμόρφωση δυναμικών προσεγγίσεων, τόσο για τη βελτίωση των συνθηκών υγείας σε άτομα που ζουν στην κοινότητα, όσο και για την επισήμανση της προσοχής σε ορισμένα ευρήματα και για τη διατύπωση ερευνητικών κατευθύνσεων στο συγκεκριμένο θέμα.

**Λέξεις ευρετηρίου:** COVID-19, Κοινωνικοί καθοριστικοί παράγοντες, Πανδημία, Συστήματα υγείας, Τρόπος ζωής, Υγεία

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