

# Knowledge, Practice And Attitude About The Detrimental Effect Of Social Lockdown And Quarantine Due To Covid\_19 Pandemic On Human Health Aspects

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## Abstract

COVID-19, a severe respiratory infection, first appeared in Wuhan, China, and quickly spread throughout the world. To contain the COVID-19, several measures have been implemented around the world, and these actions have different effects on quality of life related to health (HRQoL). Even though lockdown and quarantine help to reduce the number of SARS COV2 infections, they also have detrimental impacts on the general public's health. The purpose of the study is to provide light on the harmful health impacts of social isolation and quarantine. From the results obtained it was observed that most often, lockdown and quarantine ended with negative impacts on human life and health. These were mainly noticeable and observed in long-lasting pandemics lasting longer than one month, with some even occurring just days after pandemics. These frequently include cardiovascular, musculoskeletal, and psychological consequences.

**Keywords:** Quarantine, social lockdown, Covid – 19, pandemic.

## Introduction

Since the outbreak of SARS-COV2 infection in Wuhan, China, in late December 2019, the disease has spread rapidly from country to country, eventually reaching pandemic level. The intensity and clinical effects of this infection are thought to be influenced by the nature of the patient's pre-existing medical conditions, as well as the sorts of chronic medications he or she is currently using [1]. Coronavirus disease 2019, also known as COVID-19, is a viral infection caused by the coronavirus that causes severe acute respiratory syndrome (SARS-CoV-2) [2,3].

Inter-human transmission of this microorganism, like that of other Coronaviridae members, is primarily mediated by respiratory tract infection, which is mediated by so-called respiratory droplets, which are formed by water and various inclusions and can be generated while talking, breathing, coughing, or sneezing [3,4]. As a result, a combination of contact tracing and social isolation appears to be the most effective strategy for controlling the COVID-19 outbreak. [3]. Lockdown, which is sometimes used as a euphemism for "mass quarantine," is usually based on "stay-at-home" or "shelter-in-place" ordinances issued by the government or authority (national or regional) for the purpose of inflicting Distancing from society and so restricting or prohibiting population movement within and outside of a particular area. As a result, it is frequently utilized In order to combat a continuous outbreak [3,5]. The term quarantine was originally used in relation to leprosy in Venice, Italy in 1127,

and was widely employed in response to the Black Death, however it was not used until 300 years later that the United Kingdom began to impose quarantine in response to plague [6].

Lockdown and quarantine do have negative consequences on general public health despite their favorable effects on reducing the number of SARS COV2 infections and consequently reducing the risk of death from the virus[7]. These medical conditions fall under the following categories:

**Cardiovascular Effects:** Quarantine, an effective technique for reducing the burden of infectious disease epidemics, has a significant impact on heart disease risk[8,9]. These limits will have a significant impact on people's lifestyles, increasing the risk for heart disease[8,10]. Prolonged quarantine periods, disappointment, tedium, insufficient supplies, insufficient information, economic loss, and stigma were all cited as stressors. Furthermore, throughout an outbreak, people are afraid of becoming ill or dead. These unpleasant emotions are linked to systemic inflammation and endothelial dysfunction, and also a proclivity to follow a sedentary lifestyle[8,11]. Stress, both transient and prolonged, stimulates the sympathetic system, increasing inflammatory responses and vascular dysfunction, which results in higher rate of atherosclerotic lesions[12,13,14]. When people are stressed, some of them eat too much and choose foods that are rich in carbs. and lipids[15,16]. Furthermore, emotional eating and a lack of movement lead to increasing weight and metabolic syndrome, both of which are important risk factors for cardiovascular disease. Obesity has also been linked to a higher incidence of Type 2 diabetes[13,14].

**Psychological factors:** Isolation from friends and family, loss of liberty, uncertainty about sickness condition, and tedium can all have serious consequences [17]. After the implementation of quarantine in prior pandemics, suicide attempts have been reported[18]. Quarantine for extended periods of time was linked to impaired mental health, notably post-traumatic stress syndrome. [19,20]. Worries about one's own wellbeing or of exposing others to the infection, as well as worry of transmitting infection to the family members[17,20]. Fear whether you had any symptoms which could be associated to the infection, and anxiety that the symptoms could be a sign that you had the illness, were linked to psychological consequences many months later.[17]. During quarantine, economic loss can be an issue, as people are incapable of work and are forced to halt their professional activity without warning; the consequences seem to be long-lasting. Economic losses because of quarantine caused severe socioeconomic stress, and was determined to be a significant predictor for psychological illnesses, as well as aggression and anxiousness, several months later [17]

**Musculoskeletal Factors:** The drastic decrease in physical activity caused by mandatory homestay may be one of the most visible negative effects of total lockdown, not only for active people who regularly participate in recreation activities, but also for those who walk or cycle to work or those whose job requires some form of physical activity.[3]. The combination of sudden discontinuation of physical activity and extended immobility has been shown to have a variety of negative health effects, including muscular atrophy and bone diminishment, lower aerobic capacity, and an increased chance of collapsing when exercising again. One of the most serious consequences of physical inactivity is the danger of weight gain, which can lead to overweight or obesity. Another clear effect of extended home stay is inadequate exposure to the light of the sun, which is associated by a drop in circulation vitamin D [25-hydroxycholecalciferol; 25(OH)D]. Musculoskeletal issues (e.g., low back pain, carpal tunnel syndrome) are the most common negative effects.[21]

as discussed above, the decreased sun light exposure due to thong time stay at home will decrease Vitamin D levels in the body. Another essential element of vitamin D is its complex interaction with the immune system and infectious disorders, which has been the subject of numerous recent research. Many immune cells, such as monocytes and T and B lymphocytes, have large levels of vitamin D receptors. Vitamin D insufficiency is usually linked to increased susceptibility to and severity of many viral illnesses, as this hormone regulates the functionality of these cells [22,23]. Recent research has found that people who are deficient in vitamin D are at a greater risk of having respiratory tract infections. Vitamin D deficiency owing to insufficient sunlight may arise because SARS-CoV-2 is a coronavirus that primarily causes a respiratory viral infection[24].

## Methodology

## Study design and setting

In the period between January 2021 to November 2021 the study was conducted at Al-Basra governorate / Iraq to assess the effect of quarantine on the chronic diseases. Basra governorate was the second large area in Iraq and during the pandemic period the local government committed to the directions of Higher Health and safety committee by the application of prolonged lockdown.

## Study population and sample

All the doctors (60) who were working in Basra during the pandemic period were eligible for participation. After performing a pilot study with 3 doctors a total of 60 doctors agreed to participate in the study.

## Study Tools

Based on comprehensive literature review, a questionnaire was made to assess the opinion of health care providers about the effects of quarantine on the chronic diseases of the patients on both short-term levels.

The first part of the questionnaire was general questions about the main demographic variables of the participants in the study.

Part 2 containing questions about the effects of lockdown on patients with chronic diseases but not infected with COVID-19 by asking the participants health care providers about the major disorders increased due to the lockdown, measures to overcome such issues, the effect of lockdown on the public health from the participant point of view.

Part 3 involve questions about the effects of COVID-19 infection on the health status of the patients with chronic diseases both on short term basis by asking the participants health care providers about the major disorders increased due to the COVID-19 infection, measures to overcome such issues, the effect of COVID-19 infection on the public health from the participant point of view.

## Statistical Analysis

Data of the study participants were entered; managed and analyzed using the statistical package for social sciences (SPSS) version 25 software for windows. All variables were checked for errors or inconsistency prior to analysis process. The level of significance was set below 0.05 in which the difference or correlation considered as significant.

## Results and Discussion

Sex		
	Frequency	%
male	42	70.0
female	18	30.0
Total	60	100.0
Age		
25-35	7	11.7
35-45	21	35.0
45-55	23	38.3
55-65	9	15.0
Total	60	100.0

Qualification Degree		
MBBCh	5	8.3
High Diploma	2	3.3
MSc	11	18.3
PhD	6	10.0
Board	36	60.0
Total	60	100.0
Job Title		
Consultant physician	19	31.7
Specialist physician	38	63.3
Board student	1	1.7
Permanent resident	1	1.7
Rotator resident	1	1.7
Total	60	100.0
Speciality		
Internal medicine specialties	39	65.0
Surgical specialties	21	35.0
Total	60	100.0

**Table (1) represents the descriptive analysis of the doctor's sample**

A total of 60 participant doctors participated in the study from various locations in Basrah/ Iraq. As it shown in table (1) that the males were higher in the sample of the study and represents (70%) of the sample whereas the female represents (30%) and that represent the fact that most of the internal medicine specialists in Basra are males, also most surgical specialty doctors are males. also, we notice that most of the responders are in the age between (45-55) with the percent of (38%) of the sample followed by the age group between (35-45) which has the percent of (35%) and that because majority of the sample was specialist physicians who falls within this age groups. While the smallest percent in the sample was the age group between (25-35) which represents (12%) and this age group represents the rotator and permanent physicians who are of small number in the sample.

From the job title point of view, we see that the specialist doctors represent the largest percent in the sample (63.3%) followed by the consultant doctors (32%) while the rest of job titles were very small and do not exceed the (2%) and that add strength to the results as the specialists and consultants' doctors have the great experience and they are deal with most COVID-19 cases, also all the patients with chronic diseases follow up their status with their specialist doctor.

regarding the specialty, the largest percent was the internal medicine (65%), whilst the surgical specialty was (35%), as most chronic diseases are related to the internal medicine specialty in addition to that, COVID-19 cases treatment and follow up done by doctors from the internal medicine specialty, so their opinion will add benefit to the results.

		no	yes	
According to your specialty, do you see aggravated symptoms of previously known diagnosed diseases during social lockdown and COVID-19 pandemic?	c	14	46	60
	%	23.3	76.7	100.0%

According to your specialty, do you see an emergence of new abnormal symptoms (Not relevant to COVID) on patients due to the lockdown or pandemic?	c	38	22	60
	%	63.3	36.7	100.0%
Do you think lockdown or pandemic affected the public health and increased the rate of diseases related to your specialty?	c	18	42	60
	%	30	70	100

**Table (2) represent the answers of physicians about aggravation of symptoms, emergence of new symptoms, and effect of lockdown on public health respectively.**

When we asked about the aggravation of symptoms of previously diagnosed disease during lockdown most of the sample come to an agreement that there is an aggravation in symptoms. About (76.7%) of the sample respond by (yes) to this question with only (23.3%) said (No). There was controversy among the doctors about the emergence of new abnormal symptoms not relevant to COVID-19 due to the lockdown when (36.7%) of them respond by (No) indicating that there are no new symptoms and (63.3%) of them responded by (Yes). From the above table we see that most of the doctors agreed that the lockdown or pandemic affect the public health and increased the rate of diseases where (70%) of the sample responded by (Yes).

		MBCh	High Diploma	MSc	PhD	Board	
Respiratory disorders	C	1	1	0	1	1	4
	%	20.0%	50.0%	0.0%	16.7%	2.8%	
Cardiovascular disorders	C	1	1	2	2	12	18
	%	20.0%	50.0%	18.2%	33.3%	33.3%	
DM & endocrine disease	C	1	0	5	1	11	18
	%	20.0%	0.0%	45.5%	16.7%	30.6%	
Nutrition & vitamins deficiency	C	1	0	1	1	5	8
	%	20.0%	0.0%	9.1%	16.7%	13.9%	
ENT	C	0	0	0	0	5	5
	%	0.0%	0.0%	0.0%	0.0%	13.9%	
Infections & low immunity	C	0	1	0	1	0	2
	%	0.0%	50.0%	0.0%	16.7%	0.0%	
Gynecological diseases	C	0	0	0	0	1	1
	%	0.0%	0.0%	0.0%	0.0%	2.8%	
MSK disorders	C	0	0	0	0	6	6
	%	0.0%	0.0%	0.0%	0.0%	16.7%	
Psychological disorders	C	1	0	4	3	14	22
	%	20.0%	0.0%	36.4%	50.0%	38.9%	
Drug abuse	C	0	0	2	0	1	3
	%	0.0%	0.0%	18.2%	0.0%	2.8%	
Cancers	C	1	0	1	1	0	3
	%	20.0%	0.0%	9.1%	16.7%	0.0%	

Neurological disorders	C	0	0	0	0	1	1
	%	0.0%	0.0%	0.0%	0.0%	2.8%	
	Count	5	2	11	6	36	60

**Table (3) represent the relation between qualification degree and the answers about the major disorders increased due to lockdown**

Most of the board degree doctors chose the psychological disorders as major disorders increased by the lockdown (38.9%) followed by CVD & DM & endocrine disorders (33.3%) and (30.6%) respectively. The matter is the same for PhD doctors when (50%) of them chose the psychological disorders and followed by (33.3%) for the CVD. And this strengthening the results were the opinion of the specialists with most experience (Board and PhD) says that the psychological and CVD and DM & endocrine disorders are the main increased disorders. Regarding the MSC there is slight difference, (45.5%) choose the DM & endocrine followed by psychological disorders (36.4%).

		Internal medicine specialties	Surgical specialties	
Respiratory disorders	C	4	0	4
	%	10.3%	0.0%	
Cardiovascular disorders	C	14	4	18
	%	35.9%	19.0%	
DM & endocrine disease	C	12	6	18
	%	30.8%	28.6%	
Nutrition & vitamins deficiency	C	5	3	8
	%	12.8%	14.3%	
ENT	C	3	2	5
	%	7.7%	9.5%	
Infections & low immunity	C	2	0	2
	%	5.1%	0.0%	
Gynecological diseases	C	0	1	1
	%	0.0%	4.8%	
MSK disorders	C	2	4	6
	%	5.1%	19.0%	
Psychological disorders	C	18	4	22
	%	46.2%	19.0%	
Drug abuse	C	2	1	3
	%	5.1%	4.8%	
Cancers	C	1	2	3
	%	2.6%	9.5%	
Neurological disorders	C	0	1	1
	%	0.0%	4.8%	
	Count	39	21	60

**Table (4) represent the relation between specialty and the answers about the major disorders increased due to lockdown**

According to the internal medicine specialty answers, the psychological disorders were the major disorders increased when (46%) of them chose this choice followed by CVD (36%) and then DM & endocrine disorders (31%). Regarding surgical speciality, DM & endocrine disorders are the major (29%) followed by the psychological and CVD & MSK disorders which have equal percent's of (19%). Although there are differences in the answers but there is no significant statistical difference where the P value was (0.36) which is greater than (0.05).

When we discuss the above results, we can see that the answers according to sex, qualification degree, job title, specialty focus on the following major disorders: -

Psychological disorders

Cardiovascular disorders

DM & endocrine disorders

Vitamins & nutrition deficiency

In another hand as we discussed above that during the periods of lockdown the diet will be shifted towards the fast foods and unhealthy meals and lacking the fresh vegetables and fruits which are the main sources of many essential vitamins and minerals.

		MBCbB	High Diploma	MSc	PhD	Board	
Respiratory disorders	C	2	1	1	0	4	8
	%	40.0%	50.0%	9.1%	0.0%	11.1%	
Cardiovascular disorders	C	1	0	6	1	11	19
	%	20.0%	0.0%	54.5%	16.7%	30.6%	
DM & endocrine disease	C	2	0	5	0	13	20
	%	40.0%	0.0%	45.5%	0.0%	36.1%	
Nutrition & vitamins deficiency	C	0	0	0	2	7	9
	%	0.0%	0.0%	0.0%	33.3%	19.4%	
ENT	C	1	0	0	1	6	8
	%	20.0%	0.0%	0.0%	16.7%	16.7%	
Infections & low immunity	C	1	1	1	0	1	4
	%	20.0%	50.0%	9.1%	0.0%	2.8%	
Gynecological diseases	C	0	0	0	0	1	1
	%	0.0%	0.0%	0.0%	0.0%	2.8%	
MSK disorders	C	0	0	0	0	2	2
	%	0.0%	0.0%	0.0%	0.0%	5.6%	
Psychological disorders	C	1	0	0	2	3	6
	%	20.0%	0.0%	0.0%	33.3%	8.3%	
Cancers	C	0	0	0	1	0	1
	%	0.0%	0.0%	0.0%	16.7%	0.0%	
	C	0	0	0	0	1	1

Neurological disorders	%	0.0%	0.0%	0.0%	0.0%	2.8%	
	Count	5	2	11	6	36	60

**Table (19) represent the relation between qualification degree and the answers about the major disorders increased due to COVID-19 on short term basis**

Most of the board degree holders said that DM & endocrine disorders are the main affected on the short-term basis by COVID-19 infection (36.1%) followed by CVD (30.6%) and nutrition and vitamins deficiency (19.4%). The PhD opinion was psychological disorders and vitamins & nutrition deficiencies are the main affected (33.3%) for each. The MSC chose the CDV as the major disorders (54.5%) followed by DM & endocrine disorders (45.5%).

		Internal medicine specialties	Surgical specialties	
Respiratory disorders	C	4	4	8
	%	10.3%	19.0%	
Cardiovascular disorders	C	14	5	19
	%	35.9%	23.8%	
DM & endocrine disease	C	16	4	20
	%	41.0%	19.0%	
Nutrition & vitamins deficiency	C	9	0	9
	%	23.1%	0.0%	
ENT	C	4	4	8
	%	10.3%	19.0%	
Infections & low immunity	C	3	1	4
	%	7.7%	4.8%	
Gynecological diseases	C	0	1	1
	%	0.0%	4.8%	
MSK disorders	C	0	2	2
	%	0.0%	9.5%	
Psychological disorders	C	4	2	6
	%	10.3%	9.5%	
Cancers	C	0	1	1
	%	0.0%	4.8%	
Neurological disorders	C	1	0	1
	%	2.6%	0.0%	
Count		39	21	60

**Table (25) represent the relation between specialty and the answers about the major disorders increased due to COVID-19 on short term basis**

With regards to the short-term effects of COVID-19 infections on health status, (41%) of internal medicine specialty doctors said that DM & endocrine disorders are the major followed by cardiovascular disorders (35.9%). The surgical specialty doctors chose the cardiovascular disorders as first major disorders (23.8%) and then DM & endocrine disorders and respiratory disorders and ENT related disorders with (19%) for each respectively.

As we see in the above tables that most of the answers regarding the short-term effects of COVID-19 infection focused on three main disorders which are the DM & endocrine disorders, cardiovascular disorders, respiratory disorders. In accordance with our research there was a lot of articles done and prove those post COVID-19 effects and try to explain the causes behind them. Even though COVID-19 infection causes a lot of fear and draw the attention since the outbreak of the disease, but there is also some what can we call it (post COVID-19 effects) that draw some attention in many researches.

Many researches stated that COVID-19 infection could strongly affects almost all systems of the body with time leading to its deterioration encompassing the digestive, respiratory, cardiovascular, and neurological systems and can cause psychological drawbacks

According to estimates, after the epidemic is finished there will be persistent heart and lung problems in a large percent of patients. Pain in the chest along with palpitations are among the commonest symptoms reported in the researches among patient recovered from COVID-19 infection. SARSCoV-2 induced inflammation in severe COVID-19 could encourage endothelial dysfunction and insulin resistance. COVID-19 and type 2 diabetes mellitus work in concert and this might intensify the inflammatory response and contributing to a serious illness. Insulin resistance raises the risk of respiratory failure and cardiac collapse in individuals with diabetes and COVID-19 disease by inducing airway hyperreactivity.

Patients with COVID-19 who have no prior symptoms or diagnoses are said to have a higher incidence of hyperglycaemia. The proof that SARS-CoV-2 may cause diabetes is spreading, however, it is unclear at this time if this might be diabetes of the fulminant kind, autoimmune diabetes, or transitory hyperglycaemia with new onset.

## Conclusion

The WHO classified COVID-19 a global pandemic after numerous cases in China were confirmed. Due to the COVID-19's severity, numerous nations around the world have implemented a variety of controls to keep the infection at bay, including smart lockdown, total lockdown, social segregation, and body temperature monitoring during home confinement. In earlier viral pandemic events, patients detained for ten days or more experienced numerous negative blameworthy effects. The same was true with the SARS COV 2 pandemic. Anxiety, irritation, mood swings, and other psychological consequences resembled the most typical sort of disorders encountered in the population during pandemics. After people were quarantined, conditions like high blood pressure, ischemic heart disease, and others got worse. Lower and upper back discomfort, as well as muscle pain brought on by decreased sun exposure, mirrored the musculoskeletal arm of negative social lockdown effects.

## References

- [1] "Effects of medical illnesses and the chronic use of medicines on outcomes of Covid-19 patients in Basrah," 2019.
- [2] A. E. Gorbalenya et al., "The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2," *Nat. Microbiol.*, vol. 5, no. 4, pp. 536–544, 2020, doi: 10.1038/s41564-020-0695-z.
- [3] G. Lippi, B. M. Henry, C. Bovo, and F. Sanchis-Gomar, "Health risks and potential remedies during prolonged lockdowns for coronavirus disease 2019 (COVID-19)," *Diagnosis (Berlin, Ger.)*, vol. 2019, no. March, 2020, doi: 10.1515/dx-2020-0041.
- [4] Y. R. Guo et al., "The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak- A n update on the status," *Mil. Med. Res.*, vol. 7, no. 1, pp. 1–10, 2020, doi: 10.1186/s40779-020-00240-0.
- [5] B. Babic, S. Gerke, T. Evgeniou, and I. Glenn Cohen, "Algorithms on regulatory lockdown in medicine," *Science (80-. )*, vol. 366, no. 6470, pp. 1202–1204, 2019, doi: 10.1126/science.aay9547.
- [6] K. L. S. Newman, "Shutt Up: Bubonic plague and quarantine in early modern England," *J. Soc. Hist.*, vol. 45, no. 3, pp. 809–834, 2012, doi: 10.1093/jsh/shr114.
- [7] Giuseppe, L., et al. (2020). Health risks and potential remedies during prolonged lockdowns for coronavirus disease 2019 (COVID-19), *Diagnosis*, 7(2):85-90. <https://doi.org/10.1515/dx-2020-0041>.

- [8] A. V. Mattioli, M. Nasi, C. Cocchi, and A. Farinetti, "COVID-19 outbreak: Impact of the quarantine-induced stress on cardiovascular disease risk burden," *Future Cardiol.*, vol. 16, no. 6, pp. 539–542, 2020, doi: 10.2217/fca-2020-0055.
- [9] R. B. N. Lepelletier, D. Grandbastien, B. Michael, J. Smart, "Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19," *Ann Oncol*, no. January, pp. 19–21, 2020.
- [10] A. Giubilini, T. Douglas, H. Maslen, and J. Savulescu, "Quarantine, isolation and the duty of easy rescue in public health," *Dev. World Bioeth.*, vol. 18, no. 2, pp. 182–189, 2018, doi: 10.1111/dewb.12165.
- [11] A. V. Mattioli, M. Ballerini, P. Puviani, M. Nasi, and A. Farinetti, "COVID-19 pandemic: the effects of quarantine on cardiovascular risk," *Eur. J. Clin. Nutr.*, vol. 74, no. 6, pp. 852–855, 2020, doi: 10.1038/s41430-020-0646-z.
- [12] C. Wang et al., "Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China," *Int. J. Environ. Res. Public Health*, vol. 17, no. 5, 2020, doi: 10.3390/ijerph17051729.
- [13] R. Grey, I. Arora, T. Thomas, J. Saneh, A. Tohme, P., & Abi-habib, "Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information," *Psychiatry Res.*, vol. 14(4), no. January, p. 293, 2020.
- [14] A. V. Mattioli et al., "Cardiovascular prevention in women: A narrative review from the Italian Society of Cardiology working groups on 'Cardiovascular Prevention, Hypertension and peripheral circulation' and on 'Women Disease,'" *J. Cardiovasc. Med.*, vol. 20, no. 9, pp. 575–583, 2019, doi: 10.2459/JCM.0000000000000831.
- [15] S. S. Schiffman, B. G. Graham, E. A. Sattely-Miller, and M. Peterson-Dancy, "Elevated and sustained desire for sweet taste in African-Americans: A potential factor in the development of obesity," *Nutrition*, vol. 16, no. 10, pp. 886–893, 2000, doi: 10.1016/S0899-9007(00)00403-2.
- [16] G. Oliver, J. Wardle, and E. L. Gibson, "Stress and food choice: A laboratory study," *Psychosom. Med.*, vol. 62, no. 6, pp. 853–865, 2000, doi: 10.1097/00006842-200011000-00016.
- [17] S. K. Brooks et al., "The psychological impact of quarantine and how to reduce it: rapid review of the evidence," *Lancet*, vol. 395, no. 10227, pp. 912–920, 2020, doi: 10.1016/S0140-6736(20)30460-8.
- [18] D. Barbisch, K. L. Koenig, and F. Y. Shih, "Is There a Case for Quarantine? Perspectives from SARS to Ebola," *Disaster Med. Public Health Prep.*, vol. 9, no. 5, pp. 547–553, 2015, doi: 10.1017/dmp.2015.38.
- [19] L. Hawryluck, W. L. Gold, S. Robinson, S. Pogorski, S. Galea, and R. Styra, "SARS control and psychological effects of quarantine, Toronto, Canada," *Emerg. Infect. Dis.*, vol. 10, no. 7, pp. 1206–1212, 2004, doi: 10.3201/eid1007.030703.
- [20] D. L. Reynolds, J. R. Garay, S. L. Deamond, M. K. Moran, W. Gold, and R. Styra, "Understanding, compliance and psychological impact of the SARS quarantine experience," *Epidemiol. Infect.*, vol. 136, no. 7, pp. 997–1007, 2008, doi: 10.1017/S0950268807009156.
- [21] G. Lippi, B. M. Henry, and F. Sanchis-Gomar, "Physical inactivity and cardiovascular disease at the time of coronavirus disease 2019 (COVID-19)," *Eur. J. Prev. Cardiol.*, vol. 27, no. 9, pp. 906–908, 2020, doi: 10.1177/2047487320916823.
- [22] B. Prietl, G. Treiber, T. R. Pieber, and K. Amrein, "Vitamin D and immune function," *Nutrients*, vol. 5, no. 7, pp. 2502–2521, 2013, doi: 10.3390/nu5072502.
- [23] Ng Chee Ping, "基因的改变 NIH Public Access," *Bone*, vol. 23, no. 1, pp. 1–7, 2013, doi: 10.231/JIM.0b013e31821b8755.Vitamin.
- [24] M. Moriyama, W. J. Hugentobler, and A. Iwasaki, "Annual review of virology seasonality of respiratory viral infections," *Annu. Rev. Virol.*, vol. 7, pp. 83–101, 2020, doi: 10.1146/annurev-virology-012420-022445.